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THE IRON AGE

New York, January 9, 1919

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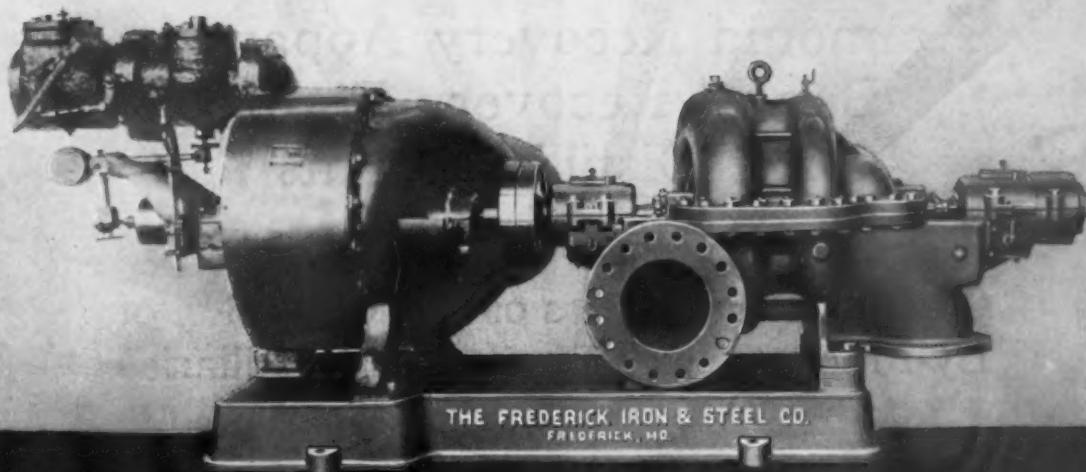
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The FREDERICK IRON & STEEL CO.
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THE KOPPERS COMPANY

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Consulting Engineers on the Operation of
By-Product Coke Plants and Auxiliaries

PITTSBURGH, PA.

THE IRON AGE

New York, January 9, 1919

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Lincoln Motor Co.'s Heat Treating Plant

Department Equipped for Quantity Production in Plant Designed for Changing from Airplane to Commercial Motor Work

BY F. L. PRENTISS

ONE notable plant that sprang up to meet the demands of the Government after our entry into the war was that of the Lincoln Motor Co., Detroit. While this company's plant since its start last spring has been building Liberty airplane motors exclusively, it was erected as a permanent institution for use in building various motors for commercial purposes, either for passenger automobiles, trucks or tractors, when its manufacturing facilities are no longer required by the Government for airplane motors.

The founder of this company and its president is Henry M. Leland, long associated with the automobile industry in Detroit as president of the Cadillac Motor Co. He severed his connection with the latter company to establish the Lincoln company. Starting without a plant or machine tool, the company within eight months erected an imposing group of factory buildings and equipped them with machinery, developed an organization, provided employment for 6000 persons, and reached a production in October of 1050 airplane motors. Another plant that had been used for making automobile parts was also taken over, remodeled and equipped.

The main plant includes a large four-story factory building, used for the various manufacturing departments and assembling; a heat-treating plant, power plant, factory restaurant, administration building, and a test field and test sheds. A great deal of attention was given to the plant layout and equipment in order to provide production and routing methods approved by modern practices.

One of the most interesting features of this plant is its heat-treating department. Before planning this department the arrangement and equipment of some of the best heat-treating plants in the country were studied, and all the details were worked out with unusual care and with a view of

providing a plant for quantity production capable of doing the highest grade of work and turning out a uniform product. Interesting features of the plant include the accurate control of the furnaces, pyrometer system, oil-cooling system, accessibility of all piping, and the methods of handling material to secure maximum and economical production.

The heat-treating plant occupies a brick and steel building, 422 x 78 ft. and 58 ft. in height to the peak of the roof monitor. It will be noted that the roof is unusually high in order to provide good ventilation. Double rows of continuous windows, with all the sections hinged for opening, are provided in the roof, there being skylights near the top of the sloping roof as well as windows in the perpendicular sides of the monitor. The roof is of Gypsite tile. There is sufficient window space in the side walls and roof to assure good lighting throughout. The interior is painted white, with the exception of 4 ft. along the bottom of the side walls, which is maroon, and the interior metal work, which is covered with aluminoid paint. The floor is of wood blocks, as this construction is generally regarded as easier for the workmen. With a wood floor the throwing of heated parts on the floor must be avoided, and metal receptacles are provided for all handling of material. The wood blocks are laid on reinforced concrete slabs 8 in. thick.

Forced air ventilation as well as heating facilities are provided by 15-hp. American Blower Co.'s blowers and heating coils on the mezzanine floors at each end. Ducts lead from these two units through the roof trusses and down both sides of the building. The air for ventilation is taken either from outside, or when the weather is extremely cold from near the floor at the ends of the building. The air is forced down through the ducts to near the floor and causes a free circulation of the



The Heat-Treating Plant Occupies a Building 58 Ft. in Height to the Peak of the Monitor in Order to Ensure Good Ventilation. In addition to the monitor windows, there are hinged skylights in the sloping roof.



One Row of the Larger Furnaces for Miscellaneous Heat Treating. Furnace control is in the hands of the attendants instead of from a central station. Indicating pyrometers are in front of the furnaces, one being shown between the quenching tanks

fumes, smoke and hot air through the outlets in the roof. The heating equipment is incidental to the blower system.

A basement of reinforced concrete construction 35 ft. wide extends the length of the building through the center, and in this all the wires and oil and air pipes are carried, and in which pumps, furnace blowers and some other equipment are located.

The quenching-oil system includes four tanks, with an aggregate capacity of 9000 gal., in the basement, and the system itself brings the total oil capacity up to 12,000 or 13,000 gal. The oil from the quenching tanks falls by gravity to the basement storage tanks, from which it is pumped through water-jacketed cooling coils on a tower just above the roof, and from these coils back to the quenching tanks. A strainer system keeps the oil clean. The oil is pumped with an electrically operated centrifugal pump with a capacity of 375 gal. per min.

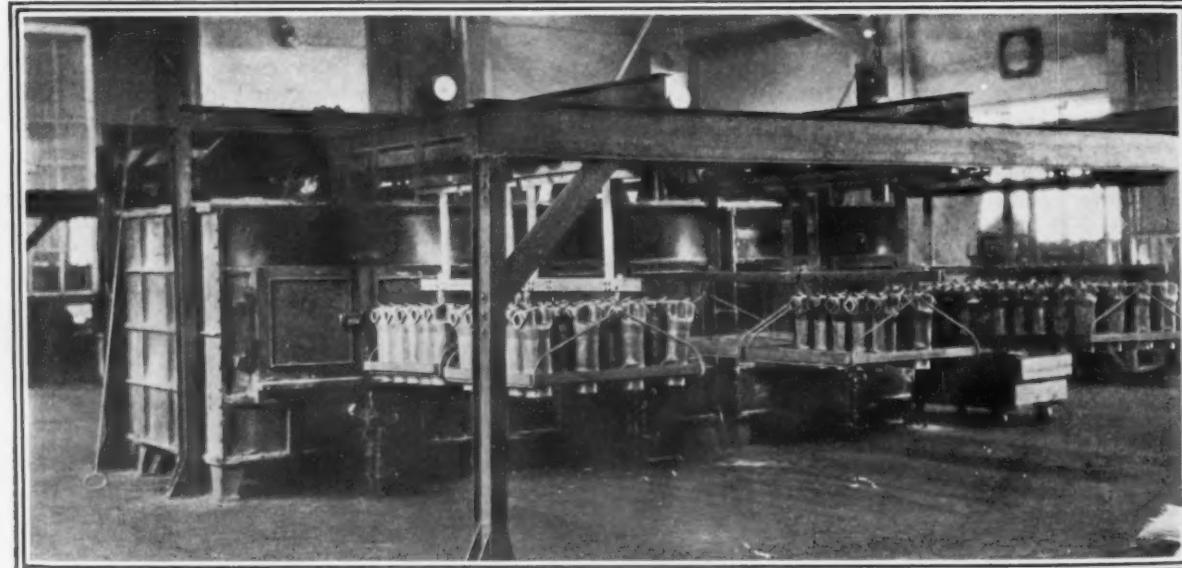
The water for cooling the quenching oil and for quenching purposes comes from a 4-in. city main at 25 lb. pressure. Two centrifugal booster pumps circulate water through the cooling coils. These pumps as well as the pump for raising the oil to

the coils were furnished by the Union Steam Pump Co. Six 8 in. sewers carry the overflow water from the quenching tanks and cooling coils. The water from the cooling system, before discharging into the sewer, passes through a separator under the roof.

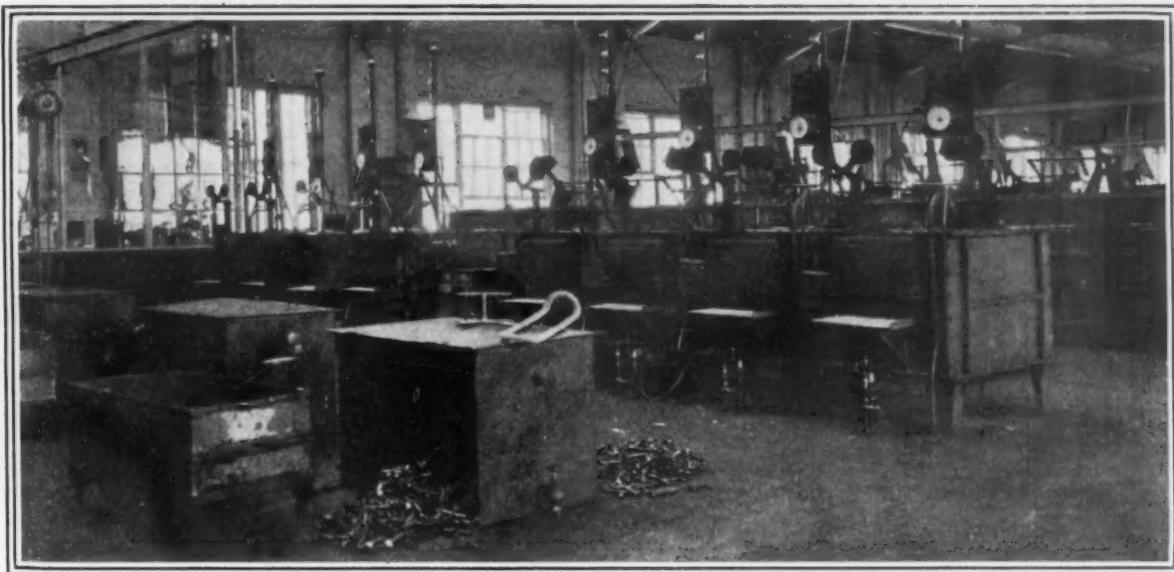
Fuel oil is stored outside in four tanks, having a total capacity of 40,000 gal. From these a Worthington triplex, with a capacity of about 12 gal. per min., pumps it to a pressure header under the roof and thence through the system.

Blast for the furnaces at 2 lb. pressure is provided by four General Electric centrifugal blowers in the basement. The blast main at the blower end is of 20 in. diameter and is reduced to 12 in. below some of the branch lines. There is a branch line for each group of four furnaces, these lines being of 6 and 8 in. diameter.

The furnaces are arranged in groups of four, one group on each side of a center aisle, making eight furnaces in a line across the building. The rows are designated alphabetically by a large letter hung over the aisle and each furnace is numbered. For example, D-3 is the third furnace in the second row. Furnaces are arranged face to face with a



Cylinders for Liberty Airplane Motors Are Annealed in Special Furnaces, 46 on One Rack Which Is Pushed Out at the Opposite Side of the Furnace After Annealing



Eight Furnaces are in a Row with a Center Aisle Between the Groups of Four. These furnaces are for production and run on a straight-line temperature. Colored light signals and partial deflectors are above each furnace. In the foreground is an adjustable tote platform for handling parts. The loop on the quenching tank is for handling material in and out of the furnaces

row of tanks between serving the two rows. A wide working space is left between the backs of furnaces. In the center aisle alongside each row of furnaces is a covered trash can and a sand fire box.

The furnace equipment, of 140 oil-fired furnaces, includes 85 semi-muffle furnaces in two sizes supplied by the Standard Fuel Engineering Co., 20 Frankfort and 12 Buckeye lead and cyanide pot furnaces, and 7 Tate-Jones furnaces, the latter in the tool-hardening department at one end of the plant. There are four quenching tanks, 4 x 2½ ft. and 30 in. deep, between the rows of small heat-treating furnaces, and six quenching tanks, 5 x 3 ft. and 30 in. deep, between the larger furnaces. Oil is generally used for quenching. Five water-quenching tanks and one brine tank are provided, two water tanks for the cyanide and lead-hardening furnaces, two water tanks for the small semi-muffled furnaces, one water and one brine tank for the tool-hardening department. The other 33 tanks are fitted for oil quenching. All oil tanks have covers, largely as a protection against fire.

There are 75 Leeds & Northrup recording pyrometers. Fifteen of these are each connected to

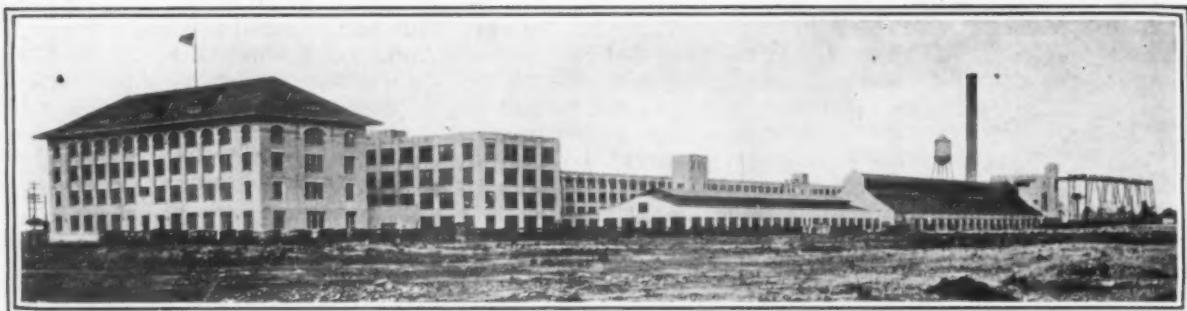
six furnaces and the remaining are one point instruments, one pyrometer serving a single furnace. The six-point recorders work with ten indicating pyrometers set on the floor, one in front of a row of furnaces, so that the operators may read their own furnace temperatures. The single recording instruments are connected with furnaces provided with color signal lights on a standard and partial deflectors showing on a dial how many degrees above or below the required heat the furnace is running.

The six-point recorders and indicators care for furnaces operated at a curve line temperature and used for miscellaneous work requiring a frequent change of heat. The single recording instruments with the automatic signal lights and partial deflectors are on furnaces operating largely on straight-line temperatures on production work, and which may be operated for several days in the heat-treating of one forging and, consequently, without change of heat. Iron-constant in couples are used with all the furnaces.

All the recording pyrometers, with one exception, used in an experimental department, are in a room where all lead wires are brought. This



The Pyrometer Room Has 74 Recording Instruments and a Terminal Board with About 2000 Connections for the Pyrometer and Signal Systems



Bird's-eye View of Plant. The administration building is at the left, the large four-story L-shaped manufacturing plant just back of it, the factory restaurant and heat-treating department in the foreground to the right, and the power plant at the extreme right

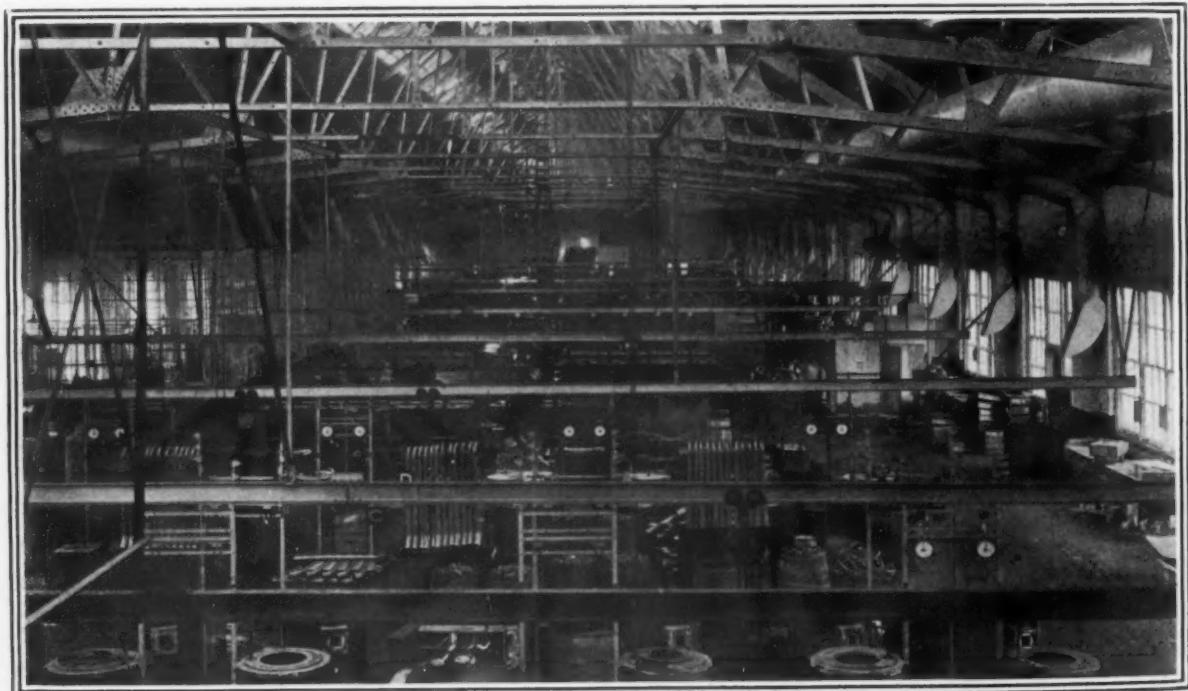
room is at one side of the plant near the center, and has a floating floor, this being an 8-in. concrete slab, having no connection with any other part of the building. The instruments are mounted on concrete piers built on this slab. The terminal board connections can be changed from any one recorder to any other, there being about 2000 connections for the pyrometer and signal system. The system eliminates a central control station.

Each furnace attendant looks after his own heats, and these are checked up in the pyrometer room. This room is in charge of three attendants, who take care of the instruments and charts as well as checking. Adjoining the pyrometer room is a control room where all power for pumps, blowers, etc., is handled.

The plant and furnaces are for straight-line operation as far as practicable. Parts to be heat-treated are received through a side door near the center and are routed in either direction, according to the part and the treatment. The first three rows of large heat-treating furnaces toward the upper end are for connecting-rods, hubs, flanges and heavy bar stock. Beyond these is a row of furnaces for carbonizing all kinds of parts. Near the end of the plant are three special furnaces for annealing cylinders, and opposite these along the side wall is the tool-hardening department. Starting at the receiving station and extending toward the other end of the plant are five rows of smaller heat-treating fur-

naces, eight in a row and two rows of five each that are used for heat-treating the lighter work, mostly machined parts. Then come four rows of cyanide and lead-pot furnaces, 32 in all, and two rows of nitrite and oil-tempering furnaces, 13 in all, for tempering small machine parts.

Numerous fixtures have been devised for handling parts in and out of the heat-treating furnaces. By means of these the furnace loads are materially increased, the loads are uniform, time and labor are saved in charging and unloading the furnaces, and the parts are dumped in the quenching tanks quickly, preventing the loss of temperature, giving all parts the same quench and largely eliminating the danger of warping. One fixture largely used, particularly for connecting-rods, is a loop 30 x 9 in. wide of extra heavy tubing with about 6 in. of one end of the loop turned up at right angles. This fixture, with its load, is handled in and out of the furnaces with tongs and hooks, and it requires but an instant to draw it from the furnace and dump its load into a quenching tank. The hot fixture is thrown on a sand pile, a number of these being located at convenient points, as the throwing of hot metal on a wood floor must be avoided. By placing a wire screen on the loop it is used for handling small parts. Another fixture has a number of arms on which gears are hung before placing in the furnaces. Cylinders are hung on racks pushed into the special annealing furnaces and out on the opposite side, the rack being reloaded



The Mezzanine Floor. The monorail tracks serve the rows of quenching tanks. The ventilating ducts are along the side walls

from the opposite end. The capacity of each rack is 40 cylinders.

A feature of the plant is that the floor is to a large extent clear of material. Much handling is by special adjustable tote platforms 4 ft. long and 2 ft. wide, on which sides 7 in. wide are built up in sections so that depth and capacity of the platforms can be increased by adding sections. These tote platforms stand on legs and are moved by hand-operated elevator trucks. Monorail tracks extend over each row of quenching tanks. Each of these has two 500-lb. chain hoists. Wire screen baskets setting on the platforms in the tanks handle small parts for quenching. A double trolley track serving both rows of tempering furnaces conveys parts to a kerosene cleaning tank at the opposite side of the room.

The pickling department is in an inclosed room

at the end of the plant below the tempering furnaces. This has a special pickling machine having two acid tanks and a water tank. An air hoist lifts the rig and the baskets containing the work. Parts after being pickled are cleaned in a Niagara metal washer.

One rather unusual feature of the plant is a tool crib operated according to machine-shop practices. All tongs, pokers and other handling tools are checked out by workmen and must be returned when they are through with them.

The erection of this plant was unusually rapid, in view of the fact that the building was largely done during the severe winter a year ago. Excavations started in November, the building was under a roof and the installation of furnaces begun in March, the first furnace was fired April 15, ten were in operation May 1 and all by June 1.

SHERMAN LAW IN FORCE

Temporary Suspension Ended—Department of Justice Makes Statement

WASHINGTON, Jan. 7.—"The Sherman and Clayton anti-trust laws are still in force!" This unofficial warning from the Department of Justice has a most important bearing on the present industrial situation. For the war had suspended the practical operation of these laws. Every industry had been brought to a state of competitionless co-operation. Although the Government presumably did the price fixing, in most of the industries it was done by agreement of the manufacturers themselves under Government control. The same co-operation of the industries eliminated styles, conserved raw materials, divided markets and allocated products. Only by this drastic elimination of competition was it possible for American industry to meet the sudden and enormous demands of war. But now that hostilities have ceased, competition must be restored. Nor is this easy. For the agreements which were made by manufacturers went far to lower production costs and maintain prices. There is a great temptation now to attempt to maintain existing price schedules and to continue, at least tacitly, the agreements which lowered factory and market expenditures.

No one in Washington is willing to define just where this will come in conflict with the anti-trust laws, for much of it will be done without formulating new agreements. In many industries, it will merely be necessary for the competing factories to stick to the war program of manufacture and prices and let it go at that.

There was considerable pressure throughout December, by various industries, to have the War Industries Board continue in force limited schedules of fixed prices as well as some of the agreements that had been made for conservation and retrenchment. It was suggested by representatives of these industries that such an operation would stabilize prices and make it easier both for the industries and the public to maintain stability until peace conditions had been completely restored. It was pointed out that a sudden relaxation of the governmental restraint and an immediate restoration of unlimited competition might be disastrous. Chairman Baruch of the War Industries Board, however, refused to accept this view and President Wilson followed Mr. Baruch's decision.

Although the officials of the Department of Justice have gone no further than to declare that the cessation of hostilities finds the anti-trust laws unimpaired, none of them is willing to suggest how drastically they may be enforced nor will they say whether the department is ready on its own initiative to start investigations. No complaints have been made that any industry is taking advantage of war time combinations to perpetuate peace monopolies or peace agreements on prices. If such complaints should be made, the department is ready to take prompt action.

It can be inferred, however, that the department officials will watch with interest the developments in

the larger industries—and this includes the iron and steel industry. The department does not look upon any agreements that may have been made concerning price fixing under Government supervision as having any sanctity after their expiration Jan. 1, 1919.

The Department of Justice is also devoting considerable attention to the Webb law, which permits corporations engaged in export trade to violate the terms of the Clayton law. The situation, however, is still far from clear. The law specifically declares that it can apply only to corporations engaged "solely" in export trade. Many of the companies and syndicates that have filed the required applications with the Federal Trade Commission have charters apparently going beyond the bounds of the statute. Both the Federal Trade Commission and the Department of Justice have taken the position that they have no authority to act. All the Commission can do is to accept applications filed by the corporations.

There has been considerable pressure for a broadening of the law which would permit such companies to do both an import and an export business. It has been pointed out that export companies are not able to compete adequately in foreign markets unless they can do import business as well. But the Congressional leaders have declined to pay any attention to this claim. Apparently they fear that the broadening of the Webb law to include import companies would enfeeble the whole operation of our anti-trust statutes, for if corporations engaged in both export and import business can violate these laws at will, they could easily subvert domestic market conditions.

On the other hand, the strict limitation of the Webb law hampers a free operation even of an export company. Take the question of ships. There is no reason why an export company should not own ships so that it may be independent of shipping companies in reaching foreign markets. But ships cannot be operated for export business "solely." They must have return cargoes. If they do, can an "export" company collect charter fees upon them?

Yet the men who have studied the problem admit that if the export companies are permitted to do a shipping business, in both directions, they would become an important factor in import commerce and this is definitely prohibited by the terms of the Webb law. Besides the Department of Justice and the Federal Trade Commission, the Department of Commerce has taken an interest in the application of the law, but so far it has taken no action. It has been suggested that Secretary Redfield might call a conference of representatives of his department with the Attorney General's office and the Federal Trade Commission but the suggestion ended there. In the meantime John F. Fort of the commission has had a series of conferences in New York with representatives of the steel, oil and chemical industries in an endeavor to shed light upon the exact meaning of the statute, but apparently all he could say was that when Congress wrote the word "solely" into the statute, it meant just what it said, and neither the commission nor the Department of Justice has any right to tamper with that situation.

Dorr Thickener in Blast-Furnace Field

Used in the Clarification of Washer Discharge Water It Eliminates Troublesome Problems and Yields Valuable Product—Simplicity of Operation

BLAST furnace plants washing the gas preliminary to use on hot blast stoves and boilers occasionally find an annoying problem presented in the disposal of the waste water from the gas scrubbers. The scrubber water discharge carries as high as 350 grains of solids (flue dust) per U. S. gal., averaging 200 grains and 1500 gal. of water per min. per furnace. The dust content of washer discharge water depends upon the working of the blast furnace, and also upon the design and extent of dry cleaning apparatus installed between the furnace and the wet washer. In the course of one year there is indicated a total of 9000 tons of flue dust carried away in the scrubber waste water of one furnace washing all gas.

The scrubber discharge water is led at some plants directly into lakes, rivers or ore boat slips. At other plants it is led through settling basins. Most frequently these basins are not only inadequate in size but are not in proximity to tracks where locomotive cranes may handle the deposited sludge. They are commonly allowed to fill up and remain filled. Banked fields or inclosed shallow lake areas, acres in extent, where the dust is settled in the shape of a constantly spreading delta, are also used but are infrequently available. They afford a cheap and satisfactory method of disposal, but sometimes involve the probability, if not the certainty, that large tonnages of ore values are permanently made non-available. Double compartment basins with a flume centrally placed, and served by an overhead crane are not uncommon. The difficulty in this system is that as the dust deposits in the compartments and on the bottom, the velocity of dust-laden water increases and the retention period decreases. Consequently the solids

or dust in the discharge water increases, gradually at first and then after two or three days very rapidly. To obtain a satisfactory discharge water, or to obtain a satisfactory recovery, the basins must be alternated frequently. Moreover, dust recovery is in such quantities and intermittent intervals that disposal by re-use is impractical if not impossible.

The first application of the Dorr continuous thickener to the clarification of washer discharge water was made at a plant in the Chicago district. At this plant, washer discharge water was previously led through a small rectangular settling basin. So much dust was carried over into the lake that dredging was necessary to maintain depth for docking and the turning of boats. A 40-ft. Dorr thickener was installed in one compartment of the old settling basin, and has now been in operation for 18 months, including three months of most severe winter conditions encountered in years. The results both as to clarification of scrubber discharge water and as to recovery of dusts have been more than satisfactory. The installation has been inspected by a number of engineers and furnace operators and further installations have been placed following these inspections during the present year at three furnace plants.

Concentration Efficiency 99.1 Per Cent

The data accumulated in the course of 30 tests are given in tables 1 and 2.

These tests were run to determine at what capacity it was favorable to run the thickener. At the time of starting the tests, no data was available upon which the performance of the apparatus could be predicted. Questions of velocities and retention



The 40-Ft. Dorr Continuous Thickener Used in the Clarification of Gas Scrubber Discharge Water. It is here shown empty. As the radial arms slowly revolve settled material is gradually moved toward the center collecting well by the rakes which will be noted at the bottom of the tank

period were important as bearing upon the capacity, it being necessary to allow the time required for a traveling particle of flue dust of any size to settle from the top to the bottom of the tank before it reached the overflow end. A considerable portion of the dusts carried in the water are colloidal in nature, *i.e.*, smaller than 200 mesh. This extreme fineness of dusts is offset partly by the relatively high specific gravity of the particles and the low viscosity of the water. The temperature of dis-

TABLE NO. 1—CLARIFICATION RESULTS OF 40-FT. DORR CONTINUOUS THICKENER

Average grains solids per U. S. gal. in inlet water to thickener, all tests		245.0
Average grains solids per U. S. gal. in overflow water from thickener:		
No. Rate of Flow Grains per U. S. Gal.		
Tests	U. S. Gal. per 24 Hr.	
2	500,000	6.2
7	1,000,000	9.2
10	1,500,000	11.7
9	2,000,000	12.5
4	3,900,000	18.4

TABLE NO. 2—AVERAGE OF NINE TESTS. ALL WATER FROM ONE GAS WASHER

Water per min., gal.	1,400
Area thickener, sq. ft.	1,250
Gal. per min. per sq. ft. area.	1.12
Dust in water at inlet of thickener, grains per U. S. gal.	268
Dust in water at outlet of thickener, grains per U. S. gal.	12.5
Dust in sludge underflow, grains per U. S. gal.	30,300
Solids in sludge, per cent.	52
Total solids discharged into thickener per 24 hr., tons	34.5
Total solids discharged in overflow water per 24 hr., tons	1.6
Total solids recovered per 24 hr., tons	32.9
Percentage recovery	95.4
Total water through thickener per 24 hr., gal.	2,016,000
Total underflow sludge from thickener per 24 hr., gal.	15,450
Ratio, water to solids at inlet of thickener	218
Ratio, water to solids in underflow sludge	1.92
Concentration efficiency, per cent.	99.1

charge water at entrance to the thickener was 106 deg. to 136 deg. Fahr. There was a drop in temperature through the thickener of from 2 deg. to 6 deg. Fahr.

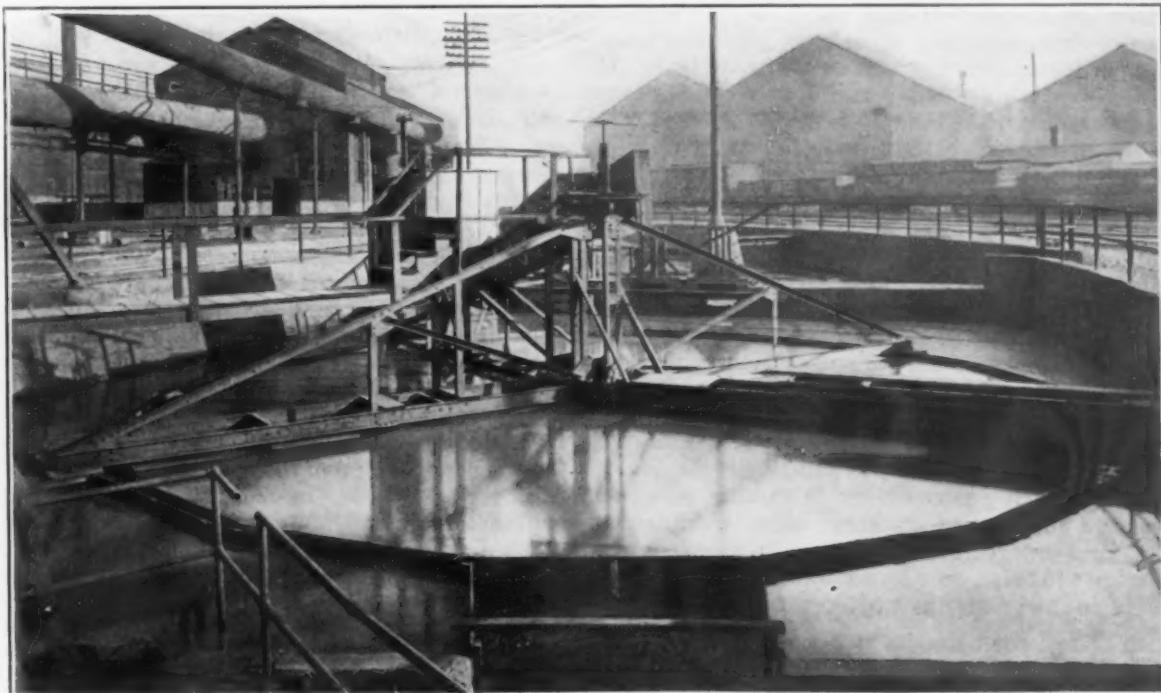
These tests showed that the 40-ft. thickener would take care of the entire water discharged from a scrubber washing all the gas from one 550-ton furnace, or 2,000,000 gal. per day. The discharge

water carrying 12-13 grains solids per U. S. gal. is practically clear water, it being a 0.22 per cent solution.

The tests further showed that even with a flow of water of 4,000,000 gal. per day clarifying results better than average results from rectangular intermittent basins could be obtained. The water discharged was naturally more turbid at the high rate than at the 2,000,000-gal. rate, but nevertheless the dusts carried in the discharge water were of such fineness that unless discharged into rivers or bays where there are no currents, no trouble from deposition would be encountered. The inlet water at the rate of 4,000,000 gal. per day carried 75.2 tons solids per day, of which 70.7 tons were recovered.

There was a rather widely varying content of dust carried in the washer discharge water to the thickener, but eliminating very heavy and abnormal dust contents following slips, it made little difference whether the washer water carries 300 or 150 grains of dust per U. S. gal. No tests were made on sieve tests of the dusts corresponding to large and small dust contents per U. S. gal. It is assumed to be true, however, that the greatest difficulty in settling the dusts arises from contents that are finer than 0.13 mm., or that will pass a 100-mesh. Assuming that the 100-mesh material amounts to 125 grains per U. S. gal., then it is usually true that any increment in dust content of water that will increase the contents to 300 grains consists mostly of very heavy and relatively coarse material that settles promptly. The varying temperatures of water encountered introduced a factor that made difficult exact determination of relations of dust content in inlet and outlet water. It is indicated that better clarification follows hotter water of decreasing viscosity. The data are not definite enough to base predictions as to degree of clarification with colder or hotter water.

From observation of tests it is believed that in installing the thickeners one should aim at obtaining a discharge water carrying from 12-13 grains solids per U. S. gal. Discharge water carrying this amount of water is only faintly tinged with red.



The Thickener Is Driven by a 2-hp. Motor. The radial arms which move the settled matter to the center, make but four revolutions per hr. Of 75.2 tons of solids carried by 4,000,000 gal. of water per day, the machine recovers 70.7 tons, which after treatment, may be re-charged in the furnace

One hour's quiescence of this type of discharge water does not suffice to settle out all solids. The water is, however, almost entirely clear, showing that some proportion of the dusts carried over in the discharge are of an ultramicroscopic or colloidal nature. This type of discharge gives no trouble by deposition in rivers or bays.

Simplicity of the Apparatus

The Dorr continuous thickener is an approximately flat-bottom tank, in the center of which is suspended vertically a slowly rotating shaft carrying radial arms at its lower end. To the lower sides of these are fastened short pieces of angle iron at such an angle that when the shaft rotates the settled material is gradually moved toward the center collecting well in the bottom. The washer discharge water is led by means of a feed launder to the loading well at the center. Here the water flows into the thickener just beneath the surface in such a manner as to cause no agitation. The water then flows from the central inlet radially out to the rim launder at the periphery. The original thickener installation is 40 ft. in diameter, 8 ft. deep at the center and 5 ft. deep at the rim. The total contents are therefore 8160 cu. ft. and the retention period of one minute's supply of water within the thickener is 43 min. It will be evident that during this time the velocity of water is increasingly retarded until at one foot from the rim launder overflow, the velocity has dropped to 0.0023 ft. per second.

The coarser dusts are precipitated relatively near the center, the finest dusts nearest the periphery. As the radial arms with attached plows are rotated (4 revolutions per hr.) the deposited dusts are moved to the bottom collecting well, from which they are removed by a diaphragm pump. It is therefore evident that the bottom of the tank is kept at a fixed level, that the flue dust does not pile up in the tank, and that the retention period and velocities are maintained, and that in consequence the efficiency of the thickener is maintained.

The dust moved to the bottom discharge opening in the center is evacuated by a "Dorreco" pump, a type of diaphragm pump so developed in its details as to be reliable for 24 hr. continuous service. The mechanical features of this pump are possibly of interest first in regard to upkeep. On this score, the only maintenance charge is replacement of the rubber diaphragm. This has proven necessary once in three months. The pump is flexible in that both the lift and the revolutions may be varied to meet the rate of deposition of sludge and its movement to the central loading well. The adjustment is made so as to obtain as thick a sludge as possible, and, once made, the pump maintains the dewatering of sludge within moderate limits. This characteristic is due to the fact that should dust contents of water be low and deposition relatively less than the average rate, the sludge becomes watery. Its fluidity, therefore, increases. The slippage in the pump increases, less sludge is pumped, more dust moves to the center well, and almost immediately the fluidity and water content of the pumped sludge decreases. These alternating fluctuations in fluidity of pump discharge and rate of discharge occur within such brief time intervals as to maintain excellent dewatering of sludge over considerable ranges of dust content in inlet water at a given rate of flow.

Dewatering Results in Four-Day Test

TABLE NO. 3—FOUR DAYS CONSECUTIVE TESTS. WATER RATE 3,900,000 GAL. PER 24 HR.			
Grains	Dust	Inlet	Water
222.6		53.8	
437.2		56.4	
279.5		52.8	
330.8		50.0	

It is believed that an exceptional degree of dewatering is attained, and that it would be most difficult to better the performance. Independent tests on the sludge by a prominent continuous filtration corporation proved that 24 hr. quiescence of the sludge and subsequent decantation of supernatant water reduced the moisture content by one per cent only. The performance of thickener and pump is indeed remarkable if it be considered that a 0.22 per cent solution is concentrated in one apparatus within 40 min. and at an expense of but two electrical hp. to a 50 per cent solution.

Reference to Table No. 2 shows the amount of sludge recovered, both in equivalent tons of solids and in gal. per 24 hr.

ANALYSIS OF SLUDGE AT 212 DEG.	
Fe	47.66
P	0.176
Mn	0.70
SiO ₂	9.19
Al ₂ O ₃	4.49
CaO	6.04
MgO	0.70
C	8.63
Alkaline	0.31

The shaft may be raised or lowered while operating, and it is fitted with an overload alarm that indicates when the amount of sludge movement is imposing too severe a strain on the mechanism. A 2-hp. motor will operate both the pump and rakes.

It is believed that the application of the Dorr thickener has entirely solved the problem of clarifying scrubber discharged water. In 1918, two 50-ft. thickeners and one 80-ft. thickener were installed at blast-furnace plants.

The production of dry flue dust averages about 180 lb. per ton iron, or for a 550-ton furnace, 49 tons per day. As wet down and weighed, it contains 15 per cent moisture. The equivalent dry dust in the sludge may be taken as 30 tons. The 75 to 80 tons of flue dust, if charged back, should represent a credit of \$150 per day, or on the basis of 350 operating days per year per blast, a yearly saving of \$52,000. There is a general feeling lately that plans involving the storage of either wet or dry dust over a period of years should be discouraged. Such stocking means that ultimately a flue dust recovery plant will have to be put in, of larger capacity than is necessary to take care of the average daily production of wet and dry dust.

Methods of Utilizing Sludge

The sludge from the thickener presents several possibilities. Two methods have been thus far used, both of which are feasible. In one case the wet sludge is pugged with the dry dust and recharged. In another case it is pumped to the stock yard, mixed with dry dust and recharged. Many furnace operators have objections to recharging raw dust or to charging wet stock, and in order to work out more generally acceptable products and methods of recharging, attention was directed to existing methods of preparation. The sludge is an excellent material to mix with dry dust preparatory to charging in sintering machines, and when these are in operation the disposal of sludge underflow resolves into a relatively simple proposition of pumping the underflow from the thickener to the sintering plant.

For new installations it is felt that briquetting offers a promising method of recharging. Briquetting of iron ores, although exclusively employed abroad for ferrous ores, and extensively in this country for non-ferrous ores, has not found wide application to the ferrous field. As viewed from the point of view of utilization of both wet and dry flue dust, it becomes most attractive.

Flue dust contains the bulk of its iron as magnetic iron, somewhat spongy in character from the

reaction conditions of the furnace. The physical state of the magnetic oxide in flue dust must not be confused with the state in which it occurs in native magnetites. In the one it is the result of igneous fusion and is dense, refractory and will not take on oxygen. In flue dust, the fresh spongy magnetic oxide has a decided affinity for oxygen and water. This affinity manifests itself in a change of color of the dust upon standing. When fresh, it is dark and almost black, while after standing in a stock pile it is red, the latter being the hematite phase following absorption of oxygen.

This affinity is made use of in the briquetting process. Usually, as the affinity is low, it is accelerated by the use of a catalytic. The catalytic in itself has no binding properties. It serves to accelerate the oxidation and hydration of the magnetic dust; the combined oxidation and hydration of the magnetic oxide converts it into a limonite or hydrated ferric oxide and in so doing cements the particles. The catalytics used are chlorides or sulphates of iron, or magnesia, and also spent pickling liquors.

Some flue dusts contain sufficient quantities of these catalytics, requiring only addition of water. The sludge recovered from the Dorr thickener is rich in catalytics and has a high cementing value. Piled by itself it cements into a hard mass due to the oxygen absorption and hydration. It has proven productive of excellent results to mix the underflow sludge with dry downcomer dust and briquette. The oxidation and hydration reactions are set up immediately, the briquette becoming hard and setting into a firm product.

The Dorr underflow is pumped into a tank which feeds in correct proportion into a pug mill; the dry dust is delivered from a bin into the same pug mill. The pug mill automatically delivers to a masticator. After inter-compounding the mix is delivered into a toggle press. This makes between 20 and 25 briquettes per min. A pressure of 8000 lb. is used, and the resulting briquettes set rapidly to hard bricks. The briquettes are kicked from the press onto a conveyor where they stock up to allow sufficient time for setting. The conveyor delivers, if possible, into the stock yard where the briquettes are handled by bridge in the same manner as ore, the labor, operating and maintenance charges being low.

Briquettes are Tough and Easily Reducible

The briquettes have a porosity of about 20 per

cent and a compressive strength of 1000 lb. per sq. in. They are $7\frac{1}{2}$ in. in dia. by $3\frac{1}{2}$ in. thick, and weigh about 13 lb. each. Being largely a limonite they are easily reducible and are tough enough to stand up in the descent through the furnace. Briquettes made from dust rich in iron are stronger than those from lean flue dust, and as the wet dust is richer in iron than the dry dust, the briquettes made from the mixture are of better quality. Unless excessive in quantity, coke freeze is not detrimental, and although an inert filler in so far as cementation is concerned, its presence is offset by the lime, alumina and magnesia. These set up into a cement in the presence of water under sufficient pressure.

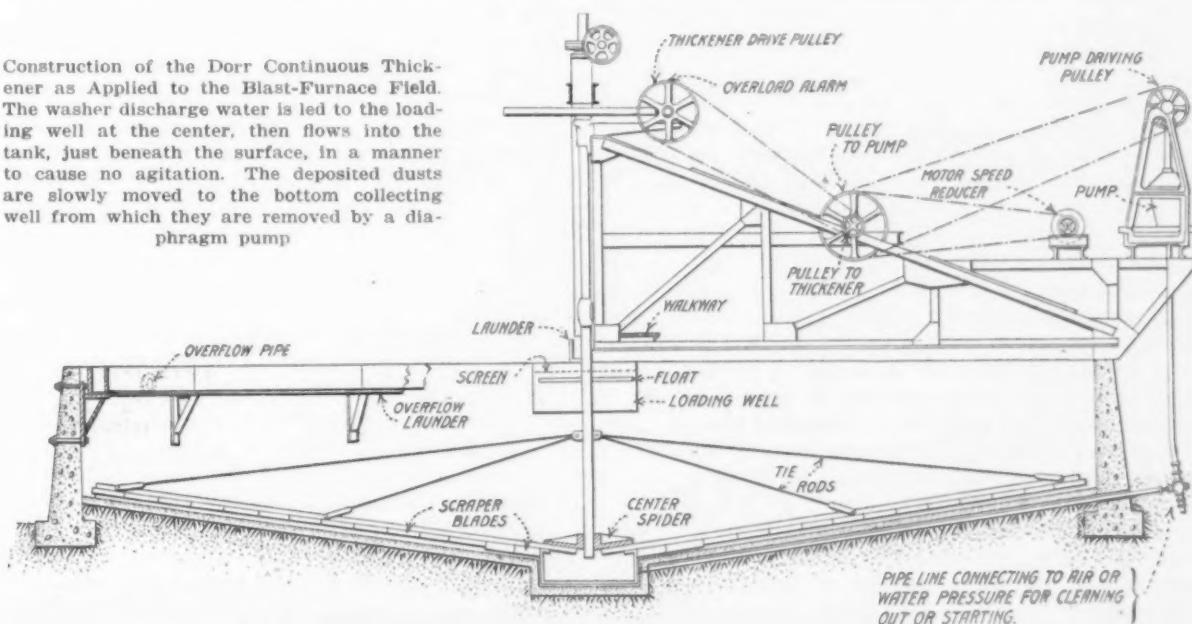
Summing up, the Dorr thickener presents three claims for interest in its application to the iron and steel industry:

1. It recovers 95 per cent of all ores carried in gas scrubber discharge water in shape to be recharged raw, mixed for sintering machines or produced in briquettes.
2. It clarifies gas scrubber discharge water so that it may be discharged into rivers, bays or slips.
3. It clarifies gas scrubber discharge water so that it may be re-used after cooling.

Installations are now being placed where the clarified washer water is continually re-used, as will be described in a later issue of THE IRON AGE. The installations are made by Freyn, Brassert & Co., of Chicago, for the Dorr Co.

The United States Cement Tile Co. is a recently organized corporation, with \$100,000 capital. Officers are as follows: Matthew Gunton, president; E. F. Norris, secretary and treasurer; G. R. Mueller, general manager; W. H. Ault, superintendent. Three of these officers were formerly connected with the American Cement Tile Mfg. Co. of Pittsburgh and New York, Mr. Gunton being one of the organizers and for several years secretary and treasurer of the latter company. Messrs. Mueller and Ault were with the concern for nine and fourteen years respectively, in responsible capacities. Mr. Norris was formerly manager of the New Castle, Pa., plants of the American Window Glass Co., and treasurer of the New Castle Portland Cement Co., now Lehigh Portland Cement Co. The purpose of the United States Cement Tile Co. is to manufacture several types of reinforced cement roofing tile of improved design. A plant is being erected at New Castle, Pa., which is expected to be in operation in the near future. General offices are located in the Lawrence Savings & Trust Building, New Castle, Pa.

The Erie Iron & Steel Co., Erie, Pa., has opened a branch office at 878 Ellicott Square, Buffalo.



Leaders Discuss Important Problems

Varied Views as to Dealing with Central Powers— Value of Co-operation Emphasized—Repeal of Sher- man Law Advocated — Good Business Predicted

ON all sides the question is being asked, "How can the experience gained in the war guide us in solving post-war problems?" In order to obtain an expression of opinion from leaders of the iron and steel trade and believing that such expression would be helpful in crystallizing sentiment and perhaps in guiding legislation, THE IRON AGE addressed a letter to a few of the leaders, requesting an expression of opinion on the following points:

1. What did the war teach as to the relations of employer and employee? Did it point the way to a plan of employee representation like that recently adopted by several steel companies, or to some other expression of democracy in industry? Is there a new labor problem?
2. Have Government control and on the other hand the public service of many men of affairs contributed anything of paramount value to the Government and to industry? Have the results been such as to encourage the continuance or extension of Government regulation?

3. What tariff or other policies should be adopted in extending our own trade and in preventing undesirable competition? What of our future trade relations with the Central Powers?
4. What is the outlook for foreign and domestic steel demand and prices in the coming year, as well as for competition from Europe, and how can the industry best meet the new conditions? Will European reconstruction be a considerable factor?

Owing to the unprecedented conditions which have existed since the signing of the armistice, a number of those addressed requested to be excused from answering the questions. Those who replied did so from a sense of duty, and their carefully thought out opinions herewith submitted are deserving of conscientious consideration by manufacturers, legislators and, in fact, by all who have any influence in the shaping of sentiment and of legislation which may vitally affect the country for many years.

GOOD VOLUME OF BUSINESS AFTER ADJUSTMENTS

JOHN A. TOPPING, CHAIRMAN, REPUBLIC IRON & STEEL CO.

YOUR letter presents some exceedingly interesting and also vital questions for discussion—problems which history sheds but little light upon because analogy cannot be applied to their solution for the obvious reason that present conditions are not entirely comparable with past periods of war and peace. Some of the issues of the present war, however, which it is hoped have been settled for all time, suggest a few applications; for instance, that autocracy must make way for democracy; that right must be substituted for might; that paternalism as a constructive force has failed to supplant individualism. From this general viewpoint I submit a few general deductions in reply, in the order given.

1. That the war has developed a stronger feeling of brotherhood and brought the world to a better understanding of what constitutes mutual obligations; that the war, while not initiating the new spirit of industrial democracy has unquestionably stimulated a spread of this doctrine throughout the industrial world. This fact is evidenced by not only labor developments abroad, but at home. Abraham Lincoln long ago breathed the spirit of this new democracy, when he said in substance "every man should have a chance to better his condition, so that the laborer of to-day might be the employer to-morrow." If the rule of right is to maintain, then the autocratic methods of trade unions and of some employers must give way to the more democratic policies of the open shop, so that industrial relations of the employer and the employee may be in future founded on more nearly a basis of economic justice. The war has not brought us any new labor problems but has developed new phases of the old problems and has focused our attention, as never before, on the necessity of working out a basis of greater reciprocal relationship, for the prevention of industrial waste by strikes and for the promotion of greater industrial efficiency.

2. The war management of industry has undoubtedly emphasized the value of co-operation, but has not strengthened public opinion as to the wisdom of Government ownership and management, but on the contrary, that any scheme of public ownership and management which suppresses individual initiative and enthusiasm is opposed to the public good. On the other hand, Governmental regulation has stimulated conservation of raw materials for war requirements and regulation might be advantageously employed to avoid the waste of ruinous competition for the protection of both labor and capital.

3. Our tariff laws should be revised, both with respect to our revenue necessities and for the purpose of reasonable protection against unfair competition or trade discrimination by other nations. Trade relations with the Central Powers should be fixed on a reciprocal trading basis and boycott measures should be discredited.

4. There is not much prospective demand for finished iron and steel from the war-ridden countries, as most of these countries are more than self-contained and under normal conditions, are exporters of finished iron and steel products. There is, however, some prospect of considerable demand being developed for pig iron and semi-finished steel, both in England and on the continent. In other parts of the world export demands on America should be heavy, for the reason that for many months to come our only serious competitor will be England and her capacity will not go around. The volume of our export trade will, of course, be more or less affected by our ability to maintain competitive conditions; therefore, much depends upon our merchant marine being put on a sound operating basis.

In conclusion, and in general I would say, notwithstanding the necessity for some liquidation which may extend itself into the year, I believe that adjustments

will occur in an orderly manner and that we will experience a good sustaining volume of business, both at home and abroad. There is also much assurance for the

future in the good crop prospects for 1919 which, taken in connection with abundance of money, have never heretofore spelled other than "good business."

NO TRADE RELATIONS WITH CENTRAL POWERS

E. W. MUDGE, EDMUND W. MUDGE & CO., PITTSBURGH

THE four questions on which you ask expression of opinion cover such an important line of thought that a book could possibly be written on each of them.

1. Employers and employees for some years past were coming closer together in industry. The war, no doubt, hastened this, and among all classes and kinds of peoples closer relations were brought about through war activities. I consider that all business to-day has two very important partners, in addition to the stockholders; they are the employees and the Government. I do not consider that there is any new labor problem.

2. Government control during the war, without a question, was a necessary evil. If continued after the war, it would be a calamity. Very considerable public service was rendered by men of affairs, who donated their service to the Government during the war, and considerable good should result from their efforts.

3. Satisfactory laws should be enacted by our Government, possibly some repealed, that would be of great help in extending our own trade and preventing undesirable competition. I do not feel as if we should have any trade relations with the Central Powers. I do not think they are worthy of any consideration.

4. The outlook for foreign trade should be very good, if we are able to get sufficient ships and operate them on an economical basis, so as to compete with other nations. There is no reason why we should not do the major part of the world's trade, if we are able to meet competitive conditions. Our domestic situation, over a longer or shorter time, will be affected very seriously by what foreign business we can do. I believe that after peace is signed and conditions are improved throughout Europe the reconstruction demand will be of considerable importance.

SHERMAN ACT SHOULD BE REPEALED

A. F. HUSTON, PRESIDENT LUKENS STEEL CO., COATESVILLE, PA.

WE have adopted an employees' representation plan whereby representatives are appointed to confer with officers of our company, similar to the plan adopted by Midvale, Bethlehem and others. The war has brought this more forcibly to us, and we believe it is the real solution of the labor problem.

2. It is a little too early, we think, to answer this definitely, as time alone will tell whether any benefits are derived from men of affairs having been Government representatives during the war. We do not believe in Government control during peace times; the fact is nearly all the war Government agencies are going out of existence.

3. The Sherman anti-trust act should be repealed. We must be continually on our guard to keep the Central Powers from again establishing their old commercial status. They surrendered before their industries were destroyed, and I believe in doing this they had in mind their future commercial standing.

4. I believe the outlook for foreign and domestic demands is very good, but there will be a short transition period which will have to be watched carefully to avoid a large reduction in prices and subsequent reduction in labor. European reconstruction will be a considerable factor, and new conditions can best be met by co-operation, and not by cut-throat competition.

PRESENT PRICES NOT NECESSARY FOR NORMAL PROFITS

W. S. PILLING, PILLING & CRANE, PHILADELPHIA

THE question of employment naturally presented new phases. While in the past there was a frequent shortage of labor and at times a very serious surplus, during the war the shortage was extremely critical. We had the usual troubles arising from restlessness, indifference and greed, but were gratified to learn by experience that many employees were exceedingly faithful and diligent. In many cases they cheerfully worked overtime without extra pay and under adverse weather and health conditions. We kept advancing their pay to conform to surrounding conditions, and stimulated their patriotism by posters, dissemination of information, by Red Cross and Liberty loan drives. Nearly all of our workmen subscribed to both of these, as well as to other similar causes. As an incentive to steady occupation, we promised to give a small Liberty bond to each man who would subscribe and make his full regular payments. We feel that to-day there is a closer relationship between the employer and employee than ever before in our history. We feel that the men are satisfied that they have been liberally and justly treated. We have no intention of reducing wages at this time. We feel quite sure, however, that, should future trade conditions make it impossible to continue

operations at the present rate of wages, the men themselves will be the first to recognize the necessity for an equitable adjustment.

2. There is no doubt but that Government control and the self-sacrificing work of men of affairs and of great ability have contributed to the success of the war. In fact, it is doubtful whether without such control and assistance the results obtained would have been possible. We see no indication of any continuance of Government control and cannot see how it could assist business, as the law of supply and demand must ultimately govern. Any evasion of these laws would be artificial, and, therefore, but temporary. We can see no advantage in the continuance of Government control, excepting perhaps in isolated cases where such control may bring about a restoration to normal conditions less abrupt than otherwise might be possible.

3. It is doubtful whether any intelligent plan can now be laid down in regard to the tariff on iron and steel. We shall probably ascertain that there has been great development in certain foreign conditions, which may produce severe competition, but until questions relating to raw materials and labor shall be better defined, it would be difficult to suggest a program of

tariff regulation. It is quite certain that ultimately, and perhaps in the near future, protective tariffs will be necessary. These should be worked out by the representatives of the trade through a commission on which both producers and consumers would be represented. Until there is some better organization of government in the Central Powers, it is practically impossible to form any conception as to what part these governments will play, either as consumers or producers. At the present time prejudice against them is so deep seated, and the question of patriotism with many entering into it, that it will act as a preventative to future trade relations. After a peace settlement has been made, the situation will be clarified and present views may be either strengthened or modified. It is almost certain, however, that sooner or later human nature will assert itself, and the dollar may gradually take the place of patriotism. The average consumer, or many of them, will talk about bygones being bygones and purchase where the price or the quality seems most attractive.

4. It is more than possible that for the next few weeks or months there will be only a moderate demand for iron and steel on new enterprises, either here or abroad. Most buyers have already purchased for a considerable forward period, and are more concerned about attempting to cancel or retard deliveries than to enter into new contracts. This condition is

the reflection of their experience with their customers. It is doubtful whether the requirements for reconstruction abroad, so far as iron and steel are concerned, will be as great as commonly estimated. No doubt in many branches there will be a moderate and even large demand, but we must remember that foreign industrial establishments have been stimulated by the war, and it would seem natural that the principal demand in the immediate future will be for machinery and for raw materials. Experience has fully demonstrated that until the buyer is convinced that the bottom has been reached, his requirements are taken care of only from month to month. When prices seem to be stable, or with a tendency toward an advance, buying becomes large and general. It is probable that after the lapse of a few months, business will again be running at high pressure, even if at lower prices than now prevailing. With a restoration of general confidence and the necessity for taking care of requirements which for years past have been neglected, the volume of business, and therefore of prices, will again bring about general prosperity. Unless interrupted by political or some unforeseen future complications, the iron and steel trade can be expected to have a long period of prosperity on a basis of values sound and permanent. The trade does not require present prices to yield satisfactory normal profits.

EFFICIENCY OF PRIVATE MANAGEMENT DEMONSTRATED

WM. A. ROGERS, ROGERS, BROWN & CO., BUFFALO

IT seems to me that in the relations between employer and employees the war has brought a more intimate acquaintance and broadened the outlook of each upon the questions which are general to both. I do not think there is a new labor problem; there still remain the same fundamental principles that each brings something of value into the partnership and that when each does his best and fairest, both prosper the most.

2. Government control had its value during the war, but beyond that its chief contribution of permanent value is the demonstration that the highest efficiency and economy lie in private management. The fact that in order to obtain the best results the Government had to overrule practically every law which has been passed in recent years in restraint of business, should occasion our legislators to thoroughly consider the wisdom of continuing many statutes which came into being under the supposition that they were popular acts at

the time of their enactment.

3. Proper tariff protection should be accorded to those industries which could not be profitably conducted before the war, but which have been encouraged to establish themselves to meet the needs of our country during the period that foreign supply was cut off. There should be no national restrictions of trade with the Central Powers, that subject being better left to the preference of the individual.

4. The outlook for foreign and domestic demand this year is not particularly rosy, neither is it discouraging. We have got to "get down to earth" again before manufacturing can be done in large volume. It goes without saying that no one could expect to get a living return on his investment in new building or expansion at the present high cost of construction; therefore, enterprises not needed immediately will await return of normal times.

LABOR LEADERS SHOULD LEND A HAND

C. D. DYER, VICE-PRESIDENT SHENANGO FURNACE CO., PITTSBURGH

IT is difficult during the present season to form any estimate upon which we would rely ourselves as to what the future holds in store for the iron and steel business.

If we revert to the conditions which prevailed after the Civil War as an available precedent, we are in for a recession of values, which, among business men, is likely to be brought about in orderly adjustment by the working of natural laws, bringing values down to a new level which may have no reference to any conditions which prevailed in the twenty years preceding 1916.

The intelligence of our labor leaders has been demonstrated on more than one occasion, and it seems improbable that these men with the knowledge and

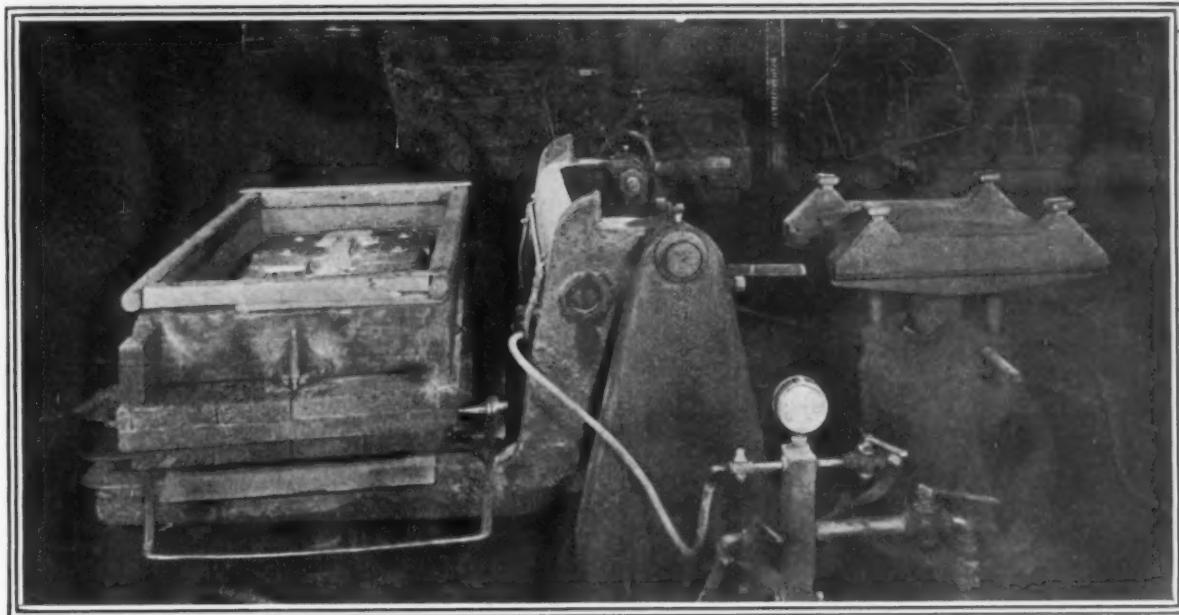
experience gained, along with their power developed within the past few years, will not lend a hand in enabling business to reach solid condition.

There is undoubtedly a large suspended amount of the construction and other demands, awaiting the time when prospective investment buyers will feel that we have arrived on a new normal basis of values which will warrant going ahead. In the meantime, we think that history will repeat itself and that business will halt for some period or other until this condition has been reached.

Certainly this country has a right to look forward to a long period of prosperity after the adjustment in values has been reached.

Molding Shoes for Caterpillar Tractors

Davenport Molding Machine with Hurriedly
Devised Handling Rigging Gives Satisfactory Results—1000 Shoes Made Per Day

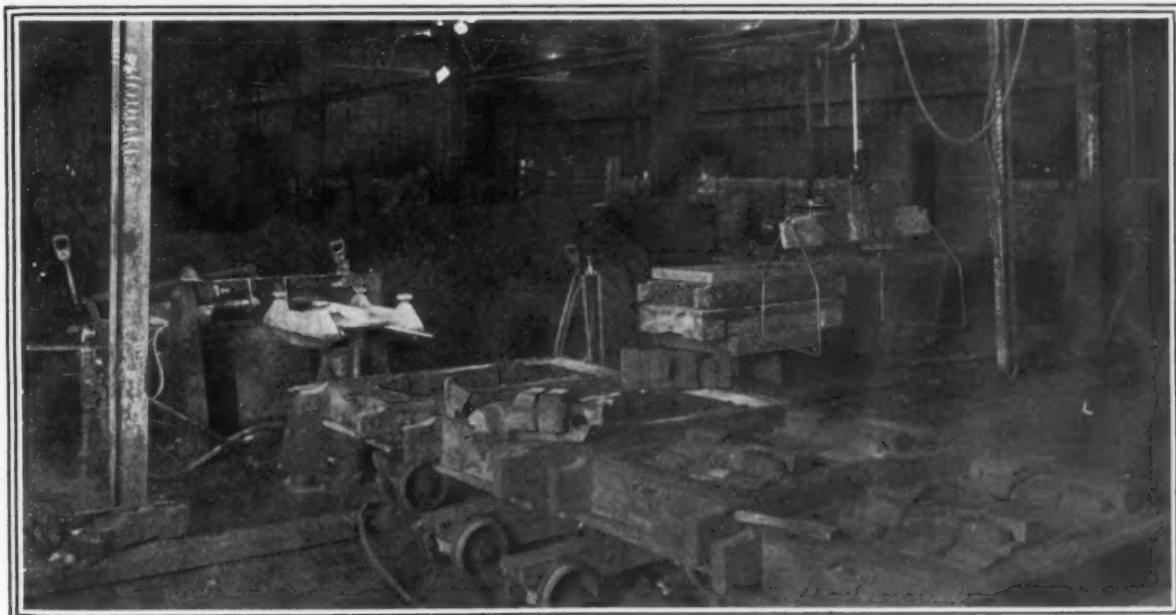


Davenport Power Jolt and Rollover Machine Used in the Making of Molds for Caterpillar Tractor Shoes. The drags are made on this machine, and the copies on a plain jolt machine. The flask is shown in the jolting side of the molding machine.

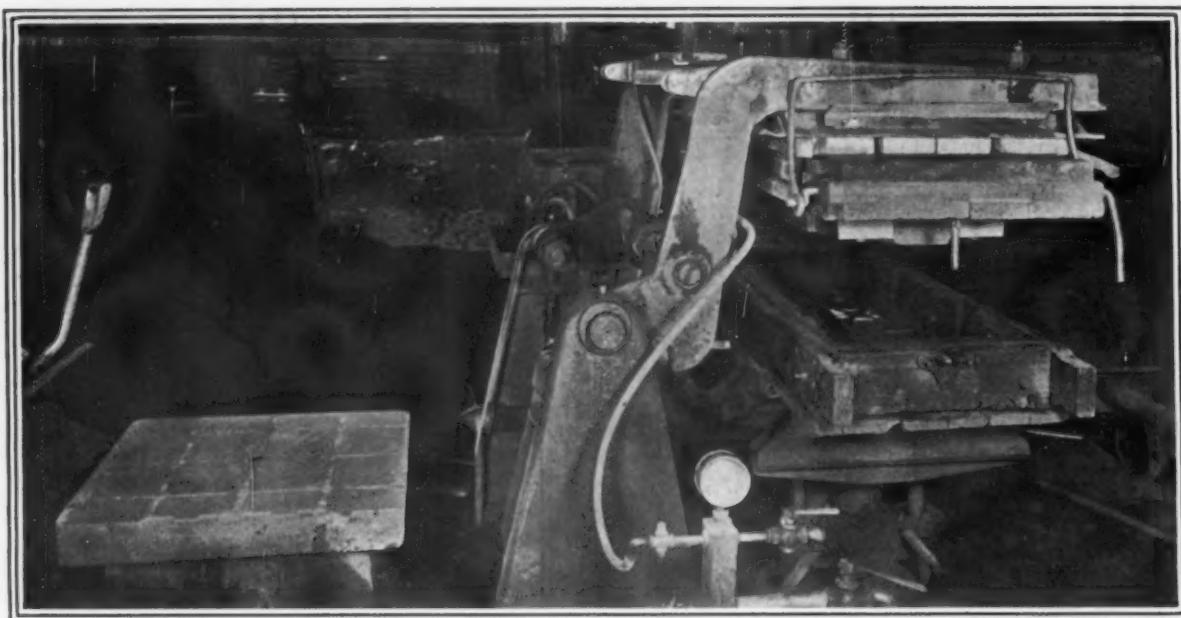
THE accompanying half-tones illustrate the method used by the Zimmerman Steel Foundry, Bettendorf, Iowa, in making molds for caterpillar tractor shoes with a combination power jolt rollover and pattern-drawing machine built by the Davenport Machine & Foundry Co., Davenport, Iowa. It is admitted that the rigging used with the machines can be criticized, but at the time the installation was made it was not a question of how well it could be designed and constructed, but how quickly and efficiently it could be done with the material at hand. The results were entirely satisfactory.

The Government did not give orders for the shoes to be made in any specific quantities beyond authorizing the making of as many as possible. Within less than a week everything was ready, and approximately 1000 shoes per day of 24 hr. were being made.

The operation of the machine is as follows: The patterns, mounted on a plate, are securely fastened to a steel pattern plate forming a part of the machine, and is alternately released and locked to a rockover frame, the latter being hinged to two standards. When this pattern plate is in the released condition, with a mounted pattern fastened to it with flask and the latter



After the Drags Are Made They Are Conveyed, Five at a Time, to This Plain Jolt Machine Where the Copies Are made, the Completed Mold Then Being Taken to the Pouring Floor. The whole arrangement was quickly devised, using materials at hand, to meet urgent Government demands



Position of the Machine When the Pattern Is Drawn from the Mold

supplied with sand, it is jolted, and the bottom board is then clamped on. The rockover operation follows, this including the automatic locking of the pattern plate with the mold.

In a reverse position, and on the opposite side of the machine from where the jolt operation took place, the mold is received on a flask-equalizing rest and the clamping device is released to permit the mold to be drawn from the pattern. Preparatory to the mold being removed from the machine to the floor, the rockover frame is turned back to its original position and the making of a new mold again begins.

The method affords the advantages of a jolt-rammed mold, an easy way of rolling over the flask and a quick and accurate draw of the pattern, all of these being brought to the limit by the employment of conveying equipment and the necessary number of men.

British Electric Steel Furnaces

In the course of a recent paper before the Staffordshire Iron and Steel Institute (British), F. J. Moffett stated that at the end of 1917 the electric furnaces installed in the United Kingdom were as follows:

Heroult	46, varying from 1½ tons to 10 tons.
Greaves-Etchell	31, varying from ½ ton to 12½ tons.
Electro-Metals	27, varying from 1½ tons to 10 tons.
Rennerfelt	8, varying from ¾ ton to 2½ tons.
Stobie	6, varying from 5 tons to 15 tons.
Other makes	22.

Of these 140 furnaces nearly one-half were in the Sheffield and Rotherham district. It was evident from the list that the arc type of furnace had established its superiority from a commercial point of view. The induction furnace was now very rarely adopted in Great Britain for steel refining. The standard sizes of furnaces with the transformer capacity and the approximate units per ton of finished steel were thus stated by the author:

Size	Transformer Capacity Kw.	Units per Ton
25 cwt.	300	850
2½ tons	500	800
5 tons	800	750

The decrease in units per ton does not go on indefinitely; when the capacity of 15 tons is reached the units per ton appear to attain their minimum value. Sir Robert Hadfield, in a recent account of the fuel and electric power consumption in his works at Sheffield, stated that in 1917 the units per ton used for 31,850 tons of electric was 782.

It is stated that there are at the present time one or more 25-ton furnaces now under construction.

The drags are made on the roll-over machine as described, and then carried on skids supported by two trucks to a plain jolt machine where the copies are made. The skids are not moved until five molds rest upon them. Then one cope after another is rammed up and, by means of a small hoist and trolley, are placed in position on the drag molds. After five molds are finished in this manner and taken to the pouring floors, another conveying apparatus with five drags is ready to be moved to a position in front of the cope machine, the one relieved having returned to the drag machine.

It is pointed out that while molding machines are labor saving devices, it takes more man power to efficiently operate a foundry equipped with them, but if two or three times as many men are required for their proper operation, the production may be increased five to ten-fold.

Correction in Proposed Contract

James T. McCleary, Secretary of the American Iron and Steel Institute, has sent out a circular calling attention to a slight error in the text of the proposed uniform contract as sent out by the institute Dec. 28. Near the end of the second sentence of the clause "specifications," the word *rollings* should be substituted for the word *shipment*. Corrected, the sentence should read as follows: "Complete specifications for each month's rollings shall be furnished on or before the first day of the month preceding that in which rolling is to be made."

In other words, the seller guarantees to *roll* the material within a given time, and this should be covered by the specifications.

Directors of the Ohio Iron & Steel Co., operating Mary blast furnace, Lowellville, Ohio, which is owned by the Sharon Steel Hoop Co., Sharon, Pa., have declared a regular dividend of 12 per cent and an extra dividend of 12 per cent, payable at the rate of 2 per cent monthly on the first day of each month in 1919. The company has \$2,025,000 of stock outstanding and the dividend disbursement next year will be \$486,000. The company paid 20 per cent in 1918, at the rate of 1½ per cent monthly. Since the sale of its blast furnace to the Sharon Steel Hoop Co. the Ohio Iron & Steel Co. has been strictly a holding company, owning a large interest in the Sharon Steel Hoop Co., received for its blast furnace and stock it owned in coal, coke and limestone properties.

The Steel Works of Saint Etienne in France has just placed in operation a new 40-ton open-hearth furnace.

WILL ORGANIZE ASSOCIATION

Material-Handling Machinery Manufacturers to Meet in New York Jan. 16

A meeting is to be held at 2.30 p. m. on Jan. 15, at the Hotel McAlpin, Broadway and Thirty-fourth Street, New York, for the purpose of forming an association of material-handling machinery manufacturers. At that meeting a statement will be made by the temporary committee of 12 representatives of such manufacturers, appointed to consider the matter of forming an association and to draft a tentative form of constitution and by-laws.

Manufacturers of material-handling machinery who are desirous of joining the proposed association are asked to send an application, not later than Jan. 6, to James A. Shepard, temporary chairman, Shepard Electric Crane & Hoist Co., 30 Church Street, New York.

There will be a luncheon at 1.15 p. m. at the Hotel McAlpin, on Jan. 16, for those who attend the convention. William C. Redfield, Secretary of the Department of Commerce, and Edward F. Carry, chairman Port and Harbor Facilities Commission, United States Shipping Board, will make addresses and others are expected, including Murray Hulbert, New York dock commissioner.

The movement has grown out of meetings held in New York on Nov. 21, 1918. There were four meetings: (1) Representatives from manufacturers of industrial trucks and tractors; (2) Manufacturers of gravity and power conveyors; (3) Manufacturers of cranes, hoists and winches; (4) Manufacturers of elevators.

These meetings were a result of conferences that took place at the office of the Port and Harbor Facilities Commission, United States Shipping Board, on Sept. 25 and Oct. 2, at Washington. Manufacturers of material-handling machinery were called by the chairman of the commission, E. F. Carry, so that he might indicate to them the desire of the Shipping Board to have the facilities for handling freight at marine terminals improved so that economies in time and operating cost would be effected which would prove a material aid to the mercantile marine being developed by our Government.

The manufacturers' representatives at the several meetings appointed three delegates each. The twelve delegates representing the four classifications met in the afternoon as a committee of the whole, and considered what would be the most suitable form of organization if an association of manufacturers were organized. The necessity of such an organization and the possible benefits to be derived by its members were discussed at that meeting, and at several subsequent meetings of the committee. It was the committee's conclusion that while there may be individual groups or associations of manufacturers in directly related lines, it would be impracticable to co-ordinate them so as to derive the principal benefits which would result from the association of manufacturers of material handling equipment. The committee, therefore, recommends to the manufacturers the formation of a single association similar to a number of other national associations of manufacturers.

Objects of the Association

The following summary gives briefly a number of the objects of the association:

It will afford a means for the co-operation of all manufacturers of material-handling machinery with the U. S. Shipping Board, port and harbor commissions, railroad commissions and other boards interested in material handling.

It will afford a means for extending the acquaintance of manufacturers' representatives, as well as co-operation among the manufacturers, stimulating interest and promoting more friendly relations.

A concentration in a general bureau of statistics of information covering the present state of the art of

mechanical handling of materials, as now practiced in this country and abroad.

The dissemination among the members of information collected and developed by the association.

The dissemination of educational propaganda which will extend the use of material handling machinery and remove the obstacles now tending to impede its progress.

Also providing facilities for collecting information with reference to foreign trade opportunities and a means of studying the requirements and keeping the manufacturers fully informed.

It has been the definite opinion of the organization committee that the association should not take up any matter affecting the commercial relations of its members, or with prospective purchasers of equipment. This condition can best be met by the direct dealing of the individual manufacturers with the prospective purchasers.

Collective Bargaining Committees for Bridgeport

The method of organization and a set of by-laws for collective bargaining committees as prepared under the auspices and to accompany the plans devised by the War Labor Board for the Bridgeport manufacturers who were party to the recent award have been submitted by Examiner Alpheus Winters. A few suggestions tending toward the promotion of good feeling in the operation of the plan were offered by the representatives of the employers and these were accepted and incorporated in the draft of the scheme.

The foreword points out that "the following plan, including the organization and by-laws for industrial committees is submitted as a means of developing a clearer understanding of the mutual problems appertaining to the company and its employees, which it is hoped to obtain by means of a free exchange of opinions and suggestions in the committee meetings on all matters of mutual concern and interest within the business. None of the provisions of this plan is to be construed as curtailing the authority or lessening the responsibilities of any executive or committee of executives of the organization or of the officers or board of directors of the company."

The plan covers the method of electing committees, their procedure after election, their powers and functions, and also provides for referendum and recall of committee when 20 per cent of their electors shall petition for a special election at which two-thirds shall vote not to retain the services of such a committeeman.

While the department committees may take up of their own accord, or upon the request of the management, such problems as the conduct of employees, individually or collectively, and thus endeavor to increase production and co-operation, yet the committee is not to have veto or executive powers. For example, it may not decide who shall or shall not be employed, or who shall or shall not receive an increase in wage, or how a certain operation shall or shall not be performed. The committee may adjust with the management by agreement, whether presented by appeal or reference or initiation, all questions in reference to the correct and proper application of the Bridgeport award, but the rights of appeal cannot be denied. Neither is the power to alter, change or add to the rulings made by the local examiner upon the award vested in any committee.

There are other similar provisions for the consultation jointly of the management's representatives with the committees of questions of mutual interest arising in the respective departments.

The molders in Cleveland, who recently demanded an 8-hr. day and \$6.50 pay for 1919, have decided to continue work under the terms of the 1918 agreement, which provides an 8-hr. day and \$5.50 pay. The foundries refused to grant the new demands, and with some shops laying off men because of the lack of orders, the Molders' Union evidently decided that it was an inopportune time to try to enforce demands for higher wages.

Inaugurates Employee Representation Plan

Effective Jan. 1, Inland Steel Co. Employees Have Carefully Devised System for Adjudicating Complaints and for Serving the General Good

Effective Jan. 1, the Inland Steel Co., Indiana Harbor, Ind., placed in operation a carefully worked out plan of employee representation, stating that it is established "in order to provide effective communication and means of contact between the management and the men on matters pertaining to industrial relations, and to insure justice, maintain tranquility and promote the general welfare." The employee representatives who have been elected will serve for one year, and it is hoped that by Jan. 1, 1920, the plan will have been fairly tried. It is specially stated that the plan will "in no way abridge or conflict with the right of employees to belong to labor unions." A workman representative, elected by his fellows, may be "recalled" if two-thirds of the voters of his department so elect. The representatives are put under oath to serve and support the laws of the United States, the State of Indiana, and the interests of the company and its employees.

The employees' representatives are elected by secret ballot, and committee meetings will be held monthly. The company is represented by a company repre-

sentative mill; sheet mill; plate mill; galvanizing departments; bolt and rivet department; mechanical department; electrical department; transportation department; yard department; roll shop; miscellaneous.

Adjustments in units of representation shall be made in accordance with the recommendations of the committee on rules, hereinafter mentioned.

II—Terms of Representatives

Representatives shall be elected for a term of one year and until their successors are elected and qualified. Representatives shall be eligible for re-election.

A representative may be recalled upon the approval by the committee on rules of a petition signed by two-thirds of the voters in his department.

A representative shall be deemed to have vacated office upon severance of his relations with the company or upon his appointment to such a position as would bring him within the meaning of Section III, Paragraph 3.

Vacancies in the office of representative may be filled in the discretion of the committee on rules by special elections conducted in the same manner as the general elections.

III—Qualifications of Representatives and Voters

Any employee, except those mentioned in paragraph 3 of this section, who has been on the company's pay rolls for a period of one year preceding the nominations, who is 21 years of age or over, and who is an American citizen or has taken out his first papers, shall be qualified for nomination and election as a representative.

All employees, except those mentioned in paragraph 3 of this section, who have been on the company's pay rolls for a period of at least 60 days prior to the date fixed for nominations and who are 18 years of age or over shall be entitled to vote.

Company officials and persons having the right to hire or discharge shall not be eligible to act as representative, nor shall they have the right to vote.

V—Nominations and Elections

The nominations and elections shall be conducted by the employees themselves in accordance with rules and regulations prescribed by the committee on rules, with only such assistance from the management as may be required by the committee on rules.

There shall be three persons nominated for every person to be elected.

VI—Management's Representative

The company shall appoint a management's representative.

The management's representative shall keep the management in touch with the representatives and represent the management in negotiations with the representatives, their officers and committees. He shall respond promptly to any request from the representatives, and shall interview all the representatives from time to time, but not less frequently than once a month, with reference to matters of concern to employees and report the results of such interviews to the management.

VII—Committees

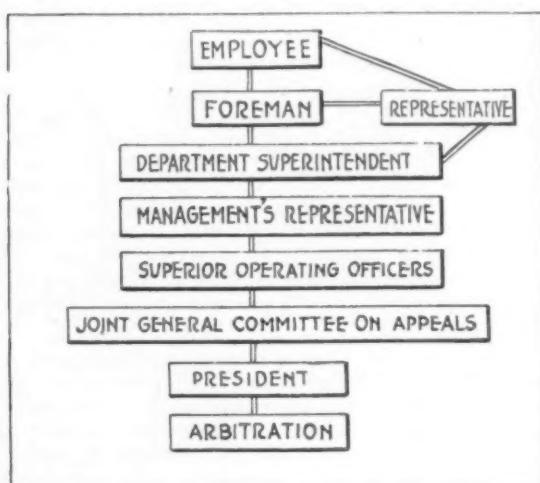
On the first Tuesday in January immediately following their election the representatives shall meet for the purpose of electing a chairman, secretary, a general committee and committee on rules, and for selecting members of such other committees as are found necessary by the committee on rules to consider the following subjects:

Wages, employment and working conditions.
Housing, domestic economy and living conditions.
Safety and prevention of accidents.
Health and works sanitation.
Transportation of employees.
Works practice, methods and economy.
Education and publication.
Recreation and athletics.
Continuous employment and reconstruction problems.

The committee on rules shall have jurisdiction to consider matters relating to rules, procedure and elections.

The general committee shall have jurisdiction to consider all matters not falling within the scope of any other committee constituted and acting hereunder, and shall when jointly composed act as a committee on appeals.

Each committee shall be composed of five members, two of whom, in the case of the general committee, shall be the



The COURSE COMPANIES WILL TAKE UNDER INLAND STEEL CO.'S PLAN FOR EMPLOYEE REPRESENTATION. Arbitration is resorted to after all other mediation has failed. Employee representatives are elected yearly by their fellow workmen in their respective departments. The plan became effective Jan. 1, 1919.

sentative. Either side may terminate the arrangement, under rules, by giving three months' notice. The men view the plan favorably, but it will be some time before its efficacy is demonstrated.

Subjects coming within the purview of the plan are:

Wages, employment and working conditions; housing, domestic economy and living conditions; safety and prevention of accidents, health and works sanitation, transportation of employees, works practice, methods and economy; education and publication, recreation and athletics and continuous employment and reconstruction problems.

The entire plan is laid out in 14 sections, the main points of which follow:

I—Representation

Representation shall be on the following basis: Departments employing under 500 employees, one representative for each 100 employees. Departments employing over 500 employees, one representative for each 150 employees, but not less than five.

For the purpose of applying units of representation based upon the departments of the company's works, the following divisions are hereby created:

Coke plant; blast furnaces; open hearth; 40-in., 32-in., 28-in. mills; 36-in. and sheet bar mills; 24-in. mill; continu-

chairman and secretary of the representatives. Each of the other committees shall appoint its own chairman and secretary. Except on approval of the joint general committee no representative shall serve on more than one committee.

There shall be joint committees which shall consist of the committees of the employees' representatives as herein provided, and representatives who shall be named by the management whose number may equal but shall not exceed the number of the employees' representatives.

VIII—Committee Meeting

Regular meetings of the committees shall be held once a month.

On alternate months the committees shall meet as joint committees.

Committees shall meet between the hours of three and five in the afternoon unless otherwise arranged for on joint approval of the chairman of the employees' representatives and the management representatives.

Special meetings of committees and of joint committees may be held as occasion may require on approval of the chairman of the employees' representatives and the management representatives.

For time necessarily occupied in actual attendance at regular meetings or at special meetings of conferences jointly approved, representatives shall receive from the company payment commensurate with their average earnings.

Representatives shall have the right to appear before and be heard by a committee on any matters of concern to the employees of the department they represent.

A committee when concerned with matters of special interest to any particular department or class of employees shall have the right of inviting into conference the representative of the employees and of the management likely to be specially interested in such matters.

Any matters may be referred by the management through the management's representative to any committee for consideration and report, and any matters may be presented by a committee to the management through the management's representative.

The joint committee on rules shall arrange a suitable place for meeting of the representatives and of the several committees and joint committees, and the company shall defray such expenses as are necessarily incident to the discharge of duties herein set forth when approved by a majority of said committee.

IX—Annual Conference

An annual conference between all the employees' representatives and representatives of the management shall be held at a time and place determined by the joint rules committee, which shall be in charge of the procedure of such conference.

X—Principles and Policies Governing Relations

The representation of employees herein provided shall in no way abridge or conflict with the right of employees to belong to labor unions.

For offenses other than such as are publicly posted, employees shall not be discharged without first having been notified that a repetition of the offense will be cause for dismissal. A copy of this notification shall, at the time of its being given to an employee, be sent also to the management's representative, and be retained by him for purposes of future reference.

1. VIOLATION OF ANY LAW:

Special attention is called to the following:

- Carrying concealed weapons; fighting or attempting bodily injury to another employee; drunkenness; bootlegging; habitual use of drugs; conduct which violates the common decency or morality of the community.
- Offering or receiving money or other valuable consideration in exchange for a job, better working place or any advantage in working condition.
- Stealing or malicious mischief, such as destroying or hiding any property of other employee or of the company.
- Inhuman abuse of live stock or negligence resulting in their death.

2. VIOLATION OF THE FOLLOWING SAFETY RULES:

- Carelessness in regard to accident and safety of fellow workmen.
- Riding on standard or narrow gage equipment or on any moving machinery where not assigned.
- Running up blocks on cranes.
- Violation of rules governing repairing or oiling of moving machinery.
- Failure to wear safety goggles that have been provided.
- Smoking within prescribed limits or other places where such practice is forbidden.
- Insubordination (including refusal or failure to perform work assigned) or use of profane or abusive language toward fellow employees or officials of the company.
- Absence from duty without notice to and permission from superintendent or foreman, except in case of sickness or cause beyond his control of a character that prevented his giving notice.
- Harboring disease that on account of his own carelessness will endanger fellow workmen.
- Changing working place without orders or prowling around the works from assigned place.

7. Falsifying or refusing to give testimony when accidents are being investigated, or for false statements when application and physical examination is being made.

8. Neglect or carelessness resulting in damage to railroad equipment, or neglect of car dropper to properly set brakes on railroad cars in his charge.

9. Robbing railroad or narrow gage car journal boxes of waste.

10. Wilful neglect in care or use of company's property.

11. Obtaining material at store house or other assigned places on fraudulent orders.

XI—Procedure for Adjustments

Any matter which in the opinion of any employee requires adjustment and which such employee has been unable to adjust with the foreman of the work on which he is engaged, may be taken up by such employee either in person or through any representative of his department.

First: With the superintendent of the department.

Second: With the management's representative.

Third: With the superior operating officers of the company who shall endeavor to effect a settlement or who may with the approval of all the parties refer the matter to any joint committee.

Unless a satisfactory disposition of any such matter has not been effected within a reasonable time, any employee through his representative, or the management through the management's representative, may require such matter to be referred to the general joint committee on appeals by a request in writing addressed to said committee, specifying in detail the matter requiring adjustment and the reasons which warrant its consideration by said committee. The general joint committee on appeals shall consider any such matter with reasonable promptness, at a regular or special meeting, and may adopt such means as are necessary to ascertain the facts and effect a settlement.

If the general joint committee on appeals fail to effect a satisfactory settlement, the president of the company shall be notified and the matter may be referred, if the president and majority of the employees' representatives on the general joint committee agree to such reference, to an arbitrator or arbitrators, to be determined at the time according to the nature of the controversy.

XII—Guaranteeing the Independence of Representatives

Each representative shall have the right to take the question of an alleged personal discrimination against him, on account of his acts in his representative capacity, to any of the superior officers, to the general joint committee and to the president of the company.

Having exercised this right in the consecutive order indicated and failing a satisfactory remedy within 30 days, a representative shall have the further right to appeal to the State Department of Labor or the Secretary of Labor of the United States. The company shall furnish the said Secretary of the State Department of Labor or Federal Department of Labor with every facility for the determination of the facts, and the findings and recommendations of the said Secretary of the State Department of Labor or Federal Department of Labor shall be final and binding.

Youngstown Industries Active

YOUNGSTOWN, Ohio, Jan. 6.—Local corporations entered upon the new year with somewhat reduced schedules in finishing departments, but on the whole are exceptionally active for this time of the year. One company is operating to capacity on sheet and tin export orders, with business in sufficient volume from such sources to insure maximum output for two months. Wire and nail trade is developing fast. The leading wire producer is considering reducing the number of types of fence wire and restricting output to standard makes.

Demand for standard pipe, both iron and steel, continues steady, with normal requirements for oil country pipe. The plate situation is not so satisfactory, orders being somewhat lax. There is likewise some uncertainty as to the immediate future for bar demand, as fabricating and shipping interests have shown a tendency to hold back. In most cases they are buying simply as the material is needed, desiring therefore immediate shipment, or are placing orders against assured business. Republic Iron & Steel Co. has stopped operation of its 96-in. plate mill for a general overhauling.

The Old Meadow mill of the Americar Sheet & Tin Plate Co., at Scottdale, Pa., will resume operations Jan. 20. The plant will give employment to 450 men. It has been closed for more than a year.

Remarkable Developments of Engines of War

A Glimpse at the Secrets of the Ordnance Proving Grounds at Aberdeen—Artillery, Tanks, Tractors and Aerial Bombs

WASHINGTON, Jan. 6.—The lid is off America's war secrets. So it becomes possible to tell some of the wonderful achievements of America's military machine, backed by American industry.

Throughout the war no spot in America was more sacredly guarded against intruders than the 36,000 acres of the Ordnance Proving Grounds at Aberdeen, Md. It required a pass from the Secretary of War, himself, to secure admission to the carefully guarded secrets that were stored here.

Now this tense guard has been relaxed and Ordnance Department Officers have been allowed to show—not without pride—some of the great things that were accomplished in our brief participation in the world war. It was an interesting sensation to clamber about on this vast experimental field among banging guns and clattering tanks and all the other paraphernalia of war. The largest share of America's war material during the war has been tested on this proving ground. In October, 1917, these 36,000 acres were smiling farms basking in the sunshine on the shore of Chesapeake Bay. Now they are a great roaring field of war, for the armistice which stopped the cannonading in Europe has had no effect here except to slacken the amount of testing which must be done to keep the army in shape for any operation that may come.

It is difficult to pick the items of greatest interest in the wealth of disclosures. Even now there is a spice of secrecy about some of the patents and processes which we have borrowed from the Allies in Europe. There is, for instance, the recoil of the 3-in. French gun—the famous "75" which the French proclaimed to be the savior of France. It is a trim death-dealing gun that can break out its fatal messages at the rate of 30 a minute. We found it on a testing range flanked by two half-brothers of the war. A bulkier British modified 18-pounder roared at its left and on its right was an even more trim looking, and pure bred American 3-in. rifle.

The French "75" scarcely jerked as it spit out its volleys, such is the perfection of the French recoil. The British gun showed a greater movement and so did the American piece, even though the latter is equipped with the French recoil. This recoil apparatus is one of the prize achievements of the French. We have been given the use of the process but the parts are manufactured at the Dodge Brothers automobile plant and the Singer Sewing Machine factories. Only six Americans know the secret details of the process and the recoil is put together under their supervision.

The real distinction, however, of the American 3-in. gun is its equipment with a specially designed American carriage that gives it a far greater play than either the French or the English gun can master. They have but a limited elevation and almost no traverse. The American model swings on an axis of elevation from -70 to $+53$ deg. Its traverse covers 45 deg.

Then we saw the large 155 mm. howitzers and next to them howitzers of 240 mm. caliber.

All of which brought up an interesting discussion about the merits of the metric system. For in manufacturing these guns in the United States it took a lot of careful transmutation from the French metric system specifications to our own inches as a mere conversion of millimeters into twenty-fifths of an inch is hardly exact enough for some of the infinitely precise fittings that are necessary.

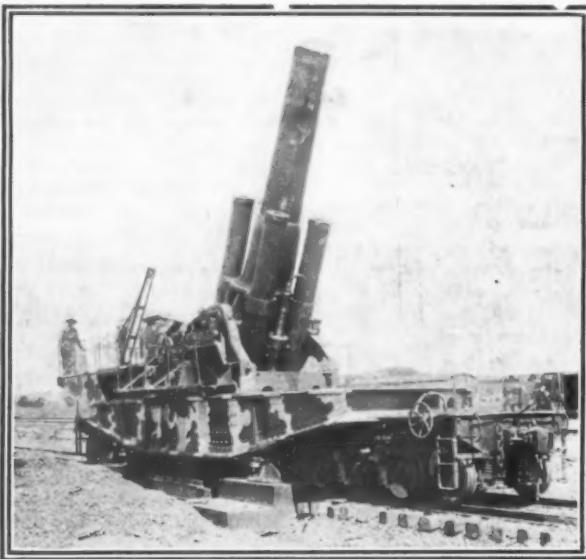
Another visit showed us the trench guns—from small 3-in. mortars that seemed to cough out their bombs, so small was the powder charge necessary to hurl them into an enemy trench, to 11-in. mortars that could hurl huge shells to a distance of 1800 yards.

One of the greatest achievements which the Ordnance Department can record is the progress that has been made in "mobile artillery." Cannon that heretofore had to be built upon concrete foundations as though they were young sky-scrappers are now carted around on tractors and railway cars ready for instant action and even more instant disappearance when they have been located by the enemy. Even the giant 16-in. howitzers are now carried on railroad cars and we watched some of them test shells over a range of 13 miles. Near one of these was a 12-in. rifle on a long elaborately built flat car with four 8-wheel trucks. It had two distinctive features. First, it was the most powerful gun at

Aberdeen. Second, it had no recoil apparatus. The energy of the recoil was absorbed by the friction produced by sliding the mount on a special track of heavy beams laid alongside the railroad track. In order to fire, it was necessary to shoot out over Chesapeake Bay. For 28 miles patrol boats and wireless signal stations had to give their O. K. that the gunners might be sure the coast was clear before the huge shell started screeching into the air.

Even more dramatic was an 8-in. howitzer mounted on a giant caterpillar tractor which climbed around over fields and through woods for our benefit, for climbed is the word. A 45 deg. grade meant nothing to this strange animal. If it found a tree of less than 10-in. diameter, it ruthlessly pushed it over and then climbed carelessly along over its prostrate trunk. Then with little ado, it stopped, but with engine running, dropped an out-rigger to get an extra brace and in less than five minutes its gun began to fire. Three rounds and the out-rigger was jerked in, a pull at the lever by the chauffeur and the tractor was under way again.

In the same field we saw a Ford baby two-ton tank. It might have been a colt of this giant tractor. It ran around among the weeds like a giant humpback mud turtle. Possibly a better simile would be a horned toad. It was a gray uninviting looking affair with a little cupola that looked like a mushroom or a Tam-o'-shanter stuck askew on one ear. This had three little slits through which the chauffeur could peep out into



A 16-in. Howitzer on Railroad Mount, Designed and Built by the American Army Ordnance Department



This American, Two Man, 6-Ton Tank Closely Resembles the Famous French Renault, the Terror of the German Machine Gun Nests. For quick transportation to the places of activity the Ordnance Engineers provided a rubber tired, ball-bearing trailer. An American artillery tractor being provided to haul the entire outfit over any kind of roadway

No-Man's-Land. At his left sat a machine gunner with his weapon stuck out through what looked like a piece of stovepipe mounted horizontally. It was armored with three-eighths inch zirconium steel. It cared as little for grades and obstacles as its bigger brothers. For in the same field were 3-ton, 5-ton and 6-ton tanks and the 35-ton monsters designed jointly by England and the United States as the "Mark VIII." "This is what the Germans were lucky in missing," said a proud colonel as he showed us the fine points of this collection. And everybody agreed with him.

Assistant Secretary of War Crowell was a member of the party and he took occasion to give us an inventory of where the armistice had left our Ordnance production. Of light Browning machine guns, 58,000 had been manufactured, and of heavy ones 46,000. Then

there were 30,000 Lewis aircraft guns and about 35,000 Marlin machine guns. All tank and tractor contracts have been cancelled. Of the two and a half ton Ford tractors only the first specimens have been made. There were 1858 five-ton, 1541 10-ton, and 128 20-ton caterpillar tractors. Of the Ford baby tanks 1250 were to have been completed this month and 2500 monthly during 1919.

American Aerial Bombs

American aerial bombs properly are classified under four types, namely, demolition, fragmentation, incendiary and dummy.

The predominating purpose of attack of the British bombing expedition during the past year was the de-structuring of railway lines, highways, etc., for which purposes the demolition bomb was used. The smallest



An American 8-In. Howitzer Self-Propelled. Was Designed by the Ordnance Engineers. One man drives the entire outfit which can negotiate any kind of ground, climb a 45 per cent grade, and be ready for action the minute it arrives. Prior to artillery tractors, it required days to move and place these big guns



This 5-Ton Artillery Tractor, Developed and Built in Large Quantities by the Ordnance Department, Has Put the Horse Out of Business so far as Pulling Guns Is Concerned. Deep mud, shell craters, sand or logs cannot detain artillery when pulled by this type of tractor. The Ordnance Department has produced them in four sizes, namely, 2½, 5, 10, and 20-ton capacity. Automobile engineers and automobile factories with large production facilities made these tractors possible

demolition bomb has a length over-all of 36.5 in., a maximum diameter of 6.1 in. The total weight of the

The Future of Iron Compared with Steel

In his presidential address to the Staffordshire Iron and Steel Institute (British) G. Carrington prophesied that the demand for iron in the future will greatly exceed that of the past. Its greater suitability for sheets, whether black, painted or galvanized, is generally conceded, its life being fully five times that of steel, and even in present conditions it is again ousting steel for railroad and colliery work, ships' decks and hatches, and where there is exposure to severe weather or to acidic liquids. Then there are plates, girders and bars for bridge building and structural and agricultural purposes, and particularly for ships. He expressed the conviction that, given the material at a reasonable price (not the same price as steel, because it will always command a better price for these purposes than steel), we shall in our time see the all-iron ship. But it is necessary to devise methods by which the necessary output can be obtained, and in his opinion there is no way except by large gas-fired mechanical puddling and scrap furnaces of anything up to about five tons, with corresponding mill and other necessary plant. There will then be no difficulty in producing ships' plates and girders in the large sizes now required, without which an iron ship could not be economically built. The rudder and stern may give trouble, and steel would perhaps be specified on account of the thickness, weight and shape required, and also the relative unimportance of rusting, but for plates, girders, bars, etc., for bridge building and structural work there would be no difficulty.

A Puddling Research Committee has been formed by the whole of the iron trade associations of the country, and it is to be hoped that something may be done to relieve the puddler of some of his heavy work. At present it is proposed to confine the investigations to 10-cwt. furnaces, but while that proposal represents a great advance Mr. Carrington thinks it is much too timid. Producers must learn to talk in tons where they now think in hundredweights, and iron can be produced as economically as steel only on the same scale.

The International Oxygen Co. has moved its general offices from New York to 796 Frelinghuysen Avenue, Newark, N. J.

bomb is 52 lb. and weight of explosive 25 lb. The crater produced by this bomb is approximately 5 ft. in depth and 12 ft. in diameter in soft soil if a sufficient delay is employed to permit the bomb reaching maximum depth.

The most popular demolition bomb on the Western front during the past year has a length over-all of 47.5 in., a maximum diameter of 7½ in., the weight of explosive is 55 lb. and the total weight of the bomb is 105 lb. These bombs give in soft soil a crater approximately 8 ft. deep and 20 ft. in diameter. A larger bomb, 59 in. in length, weighing 550 lb., makes in soft soil a crater 40 ft. in diameter.

Fragmentation and Incendiary Bombs

Fragmentation bombs were produced in large quantities. The most used type has a very sensitive nose fuse and although it explodes a short distance below the surface of the ground the shape of the bomb is such that the fragments are thrown nearly horizontally over the surface of the ground and the destruction, particularly against personnel, is very serious.

The incendiary bomb made in this country gives a flame approximately of 3 ft. diameter and 10 ft. high, and has a duration of at least 15 minutes. The length over-all is 36.5 in., the maximum diameter is 6.1 in., and the total weight is 40 lb., of which one-half is combustible.

A most satisfactory dummy drop bomb has been produced. It is constructed of concrete, the total length is 28 9/16 in., the maximum diameter is 4.7 in. and the total weight is 56.7 lb. On impact, a cloud of smoke arises indicating location of the bomb.

Importing Machinery Permitted

WASHINGTON, Jan. 7.—Consul General Skinner, at London, has cabled that a general license, valid until March 1, 1919, has been issued by the British Government to permit the importation of any quantity of the following articles: All machinery driven by power and suitable for use in cutting, working, or operating on wood, including sawing machines of all descriptions, general joiners', mortise, tenon, and boring machines; lathes and rounding machines; box and cask making machines, and all machines accessory thereto; scraping and sandpapering machines; wheewright machinery; firewood making and bundling machinery; wood, wool, fiber and pulp machinery; saw sharpening and setting machines; saw stretchers and brazing apparatus; all machines for grinding, planing or molding irons; all machine tools and machinery driven by power and suitable for use in cutting, stamping, or working metal, including lathes, milling machines, drilling machines, planers, shapers, screw machines, chucking machines, boring machines, slotting machines, grinding machines, boring and turning mills, power presses, punching and shearing machines, forging machines, cutting-off machines, gear-cutting machines and centering machines.

Since March, 1918, it has been necessary for importers of American goods to procure a "permit to purchase" before entering upon negotiations for goods in the United States. The controller of import restrictions announces that this system has now been abandoned. Goods that are still on the list of prohibited imports, and not admitted under general license, require this permit before shipment is made.

The British War Mission, which is making a tour of American industrial centers, was entertained at a banquet by the Welfare Club of the Chain Belt Co., Milwaukee, on Saturday evening, Dec. 24. C. R. Messinger, vice-president of the company, presided as toastmaster. Officials of the Federal Malleable Co. and Sivyer Steel Casting Co., Milwaukee, assisted the officers of the Chain Belt Co. in welcoming the mission, which consisted of Maj. R. C. Crossley, Maj. P. C. Cannon, W. G. Duncan and R. H. G. Gennell. The main purpose of the visit was to effect a settlement of British war contracts which have been canceled or modified as the result of the cessation of hostilities.

More Men Than Jobs in Many Places

Large Surplus of Laborers in Leading Manufacturing Centers—Officials Hope That Public Improvements Will Furnish Employment to Large Numbers

WASHINGTON, Jan. 7.—There is nothing in the labor situation to warrant any outbursts of optimism. Nor is anyone in Washington trying to conceal the difficulties which confront the Government in its efforts to find work for the demobilizing soldiers and war workers.

The statistical reports received by the Department of Labor indicate that the war shortage of labor has finally disappeared, and that there are now more workers looking for work than there is work for them to do. Yet, the real demobilization has only begun. Even the stoppage of work on war contracts has not fully made itself felt in turning laborers out for other work. Thousands of soldiers are "vacationing" before they look for work in earnest. The same is true of thousands of war workers who saved something out of their 300 per cent wages last summer. But this condition cannot last forever, and the Department of Labor statisticians are discovering that a surplus of work-seeking laborers is turning up all over the country. Detroit alone has a surplus of 20,000. Cleveland has 15,000 who wanted work and could not get it on Dec. 28. But even these figures are far from complete. In Detroit they are based on reports from 112 plants employing 145,273 workers, and in Cleveland on reports from 105 plants with 99,681 employees. Dayton, Ohio, reports a surplus of 7000 workers; Toledo, 6000, and Cincinnati, 1500. Buffalo has a surplus of 10,000 and Syracuse, N. Y., 3000, while the Savage company at Utica, N. Y., has released 3500 men, and the Remington concern at Ilion has let 6000 go. On the other hand, Pittsburgh reports a shortage of 7000 miners and Philadelphia wants 7500 men, Scranton 4000 miners and Baltimore 6800 workers, presumably shipyard employees.

Labor Surplus in Steel Industry

A comparison of figures for the weeks ending Dec. 21 and Dec. 28 for the iron and steel industry reveals the fact that that industry is carrying the heaviest part of the labor surplus. A drop of 25,514 in the payrolls of 222 firms alone carried the bulk of this unemployment. In all, 1162 firms reported a decrease from 804,327 workers on Dec. 21 to 778,813 Dec. 28. For 6009 firms in all lines of employment, there was a drop from 3,338,108 to 3,294,885.

Labor troubles are still reported from many cities, although the biggest of these—affecting some 30,000 employees of the General Electric Co. in Schenectady, Erie and Fort Wayne, is now progressing toward a settlement through the War Labor Board.

Although studiously optimistic, a review of the labor

situation given out by Louis F. Post, assistant secretary of the Department of Labor, contains enough apprehension to reveal the fears which are felt by the department officials concerning the outlook. The remedy proposed is the one which the department has been emphasizing for some time, more public improvements. Mr. Post's announcement is in part as follows:

The Department of Labor does not look forward to any unemployment crisis. * * * We must remember, however, that we have large numbers of men under arms who must be transferred to industry as rapidly as possible and that this number is many times larger than that which we have been accustomed to absorbing. Industries can not be resumed over night. Consequently there will be for some months to come the necessity for providing some form of employment for our demobilized soldiers and war workers, pending the resumption of normal activities. There are two ways in which this can be done. One is through the continuance of the manufacture of munitions and other supplies designed primarily for war purposes which are now unnecessary by reason of the signing of the armistice. The department is opposed to this course. It is simply a waste of intelligence, energy, and material. It is foolish to create work solely for the purpose of giving employment to someone. The alternative to this wasteful practice is to stimulate work which is valuable for peace time purposes. Many municipalities throughout the country, and many States as well, have during the war either abandoned or suspended considerable amounts of public improvements. The Federal Government itself has practically abandoned its building program for the past two years. This accumulation of work should be undertaken at once as a means of providing buffer employment to carry us beyond the transition period and take up such unemployment slack as may result not so much from the inability of the industries to eventually absorb demobilized soldiers and war workers as to the rapidity with which they will be required to absorb them.

To further this program of public improvement construction, the department has created a special branch, to be known as the Division of Public Works and Construction Development. There is something vague about the exact nature of the work to be done by the new service, except that it is to make a survey which "will be concerned particularly with data of significance to the construction industry." The work of the division, says the official announcement, "is a nation-wide search for facts that may be weighed by any community or investor in attempting to determine whether it is sound judgment to construct a particular public work or private building at present; the results of the inquiry will have the widest publicity and when circumstances unfavorable to construction are discovered, efforts may be made to change them, but nothing will be done to stimulate economically unsound enterprises."

United States Training Service Organized

WASHINGTON, Jan. 7.—The Department of Labor has announced the conversion of its Training and Dilution Service, organized during the war, into the United States Training Service. This will now be a peace-time organization. During the war, this service devoted its attention to the speedy "dilution" of labor by a hurried training of unskilled men to take the place of soldiers and for the growing war industries. That dilution is no longer necessary, but in its place comes a national need for a better training of employees.

"The value of industrial training," says the announcement of the department, "was amply demonstrated during the exigencies of the war. Without definite, practical methods of teaching 'green' workers to perform the new tasks assigned to them in the munitions plants, the production on the scale which was necessary would have been impossible.

"Accordingly, the Training and Dilution Service (as it was then designated) instituted about 200 training departments in as many factories engaged in making war materials. These departments diluted the skilled trades with men and women fitted through intensive training to operate machines and perform work along highly specialized lines. Most of these training departments are still being conducted to broaden the experience and craftsmanship of skilled workers and to upgrade all those concerned with production.

"Training of workers not for purposes of dilution, but as a means of reducing labor turnover, enlarging output, and improving the relations between employer and employee is sure to be a permanent policy and practice of American industries. Within the last three weeks 27 concerns have inaugurated training among their employees at the instance of the United States

Training Service. In addition, two other corporations which operate 22 separate plants, and employ an aggregate of 40,000 men and women, have announced that they are about to initiate a comprehensive training for their workers. These companies also were inspired by the Training Service to adopt this means of increasing their production and benefiting their employees.

"It is realized by most of our big manufacturers that if present wage scales are to be maintained and if foreign markets are to be opened and kept open to American products against European competition, the individual output of our workmen must be increased. Employees and employers alike are interested in effecting this increase, provided it means no impairment of wage standards or of fair profits.

"Labor turnover in this country every year represents a charge of many millions against business. The cost of hiring a man, according to Magnus W. Alexander, one of the highest authorities on the subject, runs from \$10 to \$200. The average is above \$50. This turnover is at least 250 per cent. On the basis of 10,000,000 workers in manufacturing industries alone, the cost is not less than \$1,250,000,000 annually.

Discharges Investigated

"Investigations of discharges in a big concern recently showed that only 10 per cent of them were due to personal slacking. The other 90 per cent were chargeable to failures of management. Analysis of the causes of quittances resulted in the disclosure that employers were responsible for 90 per cent and employees for 10 per cent. Industrial training cuts labor turnover in half. At the same time it increases production. These statements are based not upon theories but upon reports of the 200 manufacturers who have given training a long and severe test. Ninety per cent of them say their training departments are profitable. The remainder class them as assets.

"There are at least 20,000 American factories and plants in which industrial training can be successfully and profitably introduced. The United States Training Service is now endeavoring to 'sell' the idea to every one of these, and its efforts thus far have been very fruitful. It is expected that by June, 1919, several hundred additional manufacturers will have adopted some form of training as an aid to a large volume and a lower cost of production.

"The United States Training Service operates from a central headquarters in Washington. Charles T. Clayton is director, and S. A. Benway is assistant director of the service. Eighteen superintendents and assistant superintendents of training are now in the field. They are at work in the industrial districts in and surrounding Boston, Bridgeport, Rochester, Long Island City, New York, Philadelphia, Pittsburgh, Cincinnati, Cleveland, Detroit, Milwaukee, Chicago, and St. Louis.

"Manufacturers who desire to have their factories studied by the Government's experts and receive without charge the helpful suggestions which they make in behalf of greater efficiency and bigger production are invited to write at once to the service. Their requests will meet with prompt compliance.

"Inquiries and requests of all kinds should be addressed to the United States Training Service 618 Seventeenth Street, N. W., Washington. O. F. S.

The Diamond Scrap Iron Co., capital stock \$50,000, Louisville, Ky., has been organized by Max Zeigler, of Max Zeigler & Bros., scrap iron dealers at Muncie, Ind., and G. B. Wickersham, vice-president and general manager of the Louisville Steel & Iron Co., at Louisville, Ky. The business at Muncie will be continued by Mr. Zeigler, while Mr. Wickersham will retain his connection with the Louisville Steel & Iron Co. The volume of business on the company's books of the Louisville Steel & Iron Co. has been sufficient to allow them to operate without any shutdown. It has sufficient orders to carry it through the first quarter of this year. George H. Lowe, formerly superintendent of the Canadian Steel Foundries, at Chicago, has been appointed superintendent of the Louisville company, effective Jan. 1.

HUGE SCRAP PILE

Waste Trade Board in Charge of Permanent Reclamation Service

WASHINGTON, Jan. 7.—At the head of the nation's annual salvage stands an item of \$600,000,000 worth of scrap iron, according to a summary compiled by the new Waste Trade Board of the Department of Commerce. The second item lists \$300,000,000 of other scrap metal. Then there is \$300,000,000 for old rubber and an aggregate of \$550,000,000 for various items of waste paper, rags, cotton and wool.

The Waste Trade Board is in charge of a permanent waste reclamation service and is the peace-time name of the War Prison Labor and National Waste Reclamation Section of the Waste Division of the War Industries Board. This organization has been taken over by the Department of Commerce and is to carry out the program originally mapped out for it by Hugh Frayne, who was chairman of the Labor Division of the War Industries Board. Practically the entire personnel of the section has been taken over by the new board and J. D. Jones, formerly its executive secretary, has been made its chief. Mr. Frayne will continue his connection in an advisory capacity.

As organized by Mr. Frayne, the section was composed of representatives from the various governmental departments and organizations in Washington, including the following:

United States Army, United States Navy, United States Department of Labor, United States Department of Commerce, United States Department of Agriculture, Federal Board for Vocational Education, American Federation of Labor, National Committee on Prisons and Prison Labor.

For the purpose of nation-wide organization, the following National organizations are pledged through their Chief Executive as co-operating bodies and guaranteed the co-operation of their local chapters and branches throughout the United States:

Council of National Defense, American Federation of Labor, American Red Cross, National Y. M. C. A., National Catholic War Council, Jewish Welfare Board, Federal Board of Farm Organization, Farmers' National Headquarters, National Council of Women, National Committee on Prisons and Prison Labor.

At the time the armistice was signed local reclamation councils had been formed in 86 cities of the country, and 200 others were in process of formation, destined to make an endless chain involving the assistance of civic and fraternal organizations as well as school children. Many cities went to the extent of organizing, and many are planning to organize, permanent municipal bureaus to collect and reclaim all waste materials just as garbage and ashes are collected.

New Steel Plant in Holland

With reference to the proposed establishment of iron and steel works at Ymuiden, Holland, comprising a blast-furnace plant and rolling mill, according to a recent issue of the Dutch *Staatscourant*, the title of the new company will be the Royal Netherlands Blast Furnace and Steelworks, with its headquarters at The Hague. The concession is for 50 years. The share capital of 25,000,000 florins (£2,083,333 at par) will consist of 100 preference shares of 5000 florins each paid up in full, and of 24,500 ordinary shares of 1000 florins each (100 florins paid up per share). The preference shares can only be held by Dutchmen resident in Holland or by companies the majority of whose shareholders are Dutch. The holders of preference shares are to have the exclusive right to propose to the general meeting candidates for filling vacancies in the leading positions of the working staff or on the board. The first board of directors elected consists of representatives of the leading Dutch companies, banks, the State railroad and leading steamship administrations, such as the Holland Amerika Line, etc.

BRITISH WAR STEEL OUTPUT

Increase in Pig Iron and Steel—High-Speed Steel—Use of Waste Gases

A writer in the *Sheffield Daily Telegraph*, Sheffield, England, in one of its November issues, discusses in a very interesting manner the war and the metal trades, regarding some of the difficulties encountered by the British steel industry during the war, some of the developments as to increased production and discussing particularly the use of coke-oven and blast-furnace gases in Germany in open hearth and other furnaces. An abstract follows:

The primary task in relation to iron and steel which was imposed by the war was to increase home production in every possible way. Every available blast furnace had to be brought into operation, and the construction of all furnaces in course of building had to be hastened. There was also the necessity of using home-produced ores for the production of pig iron suitable for steel manufacture, and of extending existing steel works for the treatment of such material on an increased scale. A considerable development of rolling mill capacity has also been necessitated by the heavy demand for ships.

New Blast Furnaces

In the past this country depended largely on the importation of iron ore containing a low percentage of phosphorus, employed in the production of acid steel, and though no diminution of this supply is expected, yet the large increase which it is hoped to achieve on the basis of domestic phosphoric ores has raised new problems. To a large extent, acid type furnaces have had to give place to basic-lined, with consequent adjustments in metallurgical treatment, supply of refractory metals, and so on. Already a number of steel furnaces have been changed to basic; others have been changed over so that they can produce basic iron, and a number of other blast furnaces have been brought into operation under the new plan. It may be mentioned that the authorities anticipate an increase of at least one-fifth in the production of pig iron through the new blast furnaces and the extensions that are being or have been carried out.

During the past year there was a steady increase in the output of comparatively low grade phosphoric ores from home sources and the total output for last year exceeded that of 1916 by well over one and a half million tons. During the present year a considerably greater increase is looked forward to, and although the unpatriotic strike which took place last August in connection with the output of hematite ore cut down production considerably, we may expect an increased output of this ore amounting to at least half a million tons during the present year.

The Steel Output

As regards ingot steel, the developments have been such that the authorities expect that before the close of the current year the national capacity for steel production will have been increased by more than 50 per cent, a figure which would have been thought impossible before the war.

Large High-Speed Steel Output

The output of high speed steel before the war was only about 6500 tons per annum. This has been increased by the war to approximately 15,000 tons per annum, and tungsten, which was not produced here at all, is now being produced in this country in quantities sufficient not only for our own needs, but for a substantial contribution toward the needs of our allies. Tungsten is, of course, made from wolfram ore, which was obtained from our colonies but treated in Germany. This was previously a German monopoly, but has now fallen entirely into our hands.

Use of Coke-Oven and Blast-Furnace Gases

The utilization of the waste gases from coke ovens and of the surplus gas from the blast furnaces for operating open hearth furnaces has probably been

developed in Germany to a greater extent than it has in this country. It is not possible to speak with great certainty as to this, but the most extensive experiments were being carried out recently at the big steel works of the Georgemarienhütte, at Osnabrück, a Hanoverian town on the River Haase, where furnace gas alone is used for the tilting primary open hearth furnaces. At the time of the outbreak of war, German engineers were expressing the opinion that in a few years it would be the general practice to operate open hearth furnaces, either wholly or to a considerable extent, on blast furnace gas.

The probability is that German makers have carried into effect by this time the proposals of Schmidhammer and Von Ehrenwerth, and are regenerating blast furnace gas by passing it through coke breeze or fine coal dust heated with oxygen manufactured by the Linden process.

It will be remembered that the Hubertushütte was one of the first German steel works to use waste coke oven gas for working open hearth furnaces, and there is little doubt that this has been developed to an almost unimaginable extent in Germany. In the earlier experiments German chemists and metallurgists obtained most promising results; in one test, on a production of 6200 tons of ingots, the coal consumed amounted to only 14.9 per cent, so that well over 53 per cent of the total requirements of coal were supplanted by coke gas. At that time it was not the practice to eliminate the benzol.

Effect of Hydrogen on the Steel

It was considered by some that there was an adverse effect on the quality of the steel, and this was originally attributed to the presence of hydrogen in the heating gases. This opinion was being considered at the time war broke out, and German metallurgists were inclined to attribute any such influence entirely to errors in the temperature of the open hearth heats, which could, of course, easily be made worse by mistakes in casting. It is probable that the effect on furnace ports and roofs has by this time been reduced; it will be remembered that a year or two ago it was considered that the use of waste coke oven gas reduced their life by anything from 7 to 10 per cent.

It would be interesting to ascertain, were such a thing possible, exactly what steps the Germans are taking in connection with the by-products of coke oven plants. Further, since it is easier to utilize low grade dust coal under boilers than in the producers of open hearth furnaces, as H. Tirpitz pointed out some little time ago, it may have been proved expedient in some localities to deliver the coke oven gases to open hearth furnaces rather than to the boilers, and it may be that they have now solved the problem of whether, where engines are in use, the excess of waste coke oven gas can be more profitably used in generating power than in heating open hearth furnaces.

British practice proceeds on the assumption, as a general thing, that if there be an excess of both waste blast furnace gas and of coke oven gas, it will be best to use the latter for the furnaces and the former for the engines, because the higher calorific value of coke oven gas is of special value in the working of furnaces, but is a disadvantage with the gas engines because of the increased strain which it puts on the cylinders and valve heads as a result of the higher temperature.

Raw material for the production of ferromolybdenum is found in Sweden, but not sufficiently concentrated to be employed direct in the manufacture of the ferroalloy. The problem of the concentration of the ore, however, has been satisfactorily solved by an expert, says the London *Iron and Coal Trades Review*, who has been engaged in the concentration of iron ores and the briquetting of slag. At first ferromolybdenum was manufactured from Norwegian concentrates, and manufacture on an experimental scale was continued at Hallstahammer in 1916, and produced on a large scale by one company at Arboga (1025 lb. in 1916, and 1400 lb. in 1917), and by a second firm at Trollhättan, which in 1916 turned out 16 metric tons.

Lead and Zinc in 1918

The mine output of lead and zinc in the United States declined greatly in 1918, according to C. E. Siegenthal of the U. S. Geological Survey. The output of soft lead by mines of the Mississippi Valley and Eastern States was about 250,000 net tons, and that of argentiferous lead by mines of the Western States was about 313,000 tons, a total of 563,000 tons, compared to 273,046 tons and 378,110 tons respectively and a total of 651,156 tons in 1917, a decrease of nearly 100,000 tons. The decrease in output of domestic lead was partly made up by an increase in imports of lead in ore and bullion, particularly from Canada and Mexico, which are estimated at 14,100 tons and 78,600 tons respectively, against 5867 tons and 62,891 tons in 1917.

The production of primary domestic desilverized lead in 1918 was about 284,000 net tons, of soft lead about 210,500 tons, and of desilverized soft lead about 47,000 tons making a total output from domestic ores of about 541,500 tons of refined lead, compared with 549,895 tons in 1917, made up of 303,679 tons of desilverized lead, 187,735 tons of soft lead, and 58,481 tons of desilverized soft lead. The output of lead smelted and refined from foreign ore and bullion was about 96,500 tons compared with 62,319 tons in 1917. The total of lead smelted or refined in the United States was thus about 638,000 tons, compared with 612,214 tons in 1917. The production of antimonial lead was about 22,000 tons, against 18,647 tons in 1918. The exports of lead of foreign origin were about 38,000 tons and of lead of domestic origin about 64,500 tons, compared with 42,160 tons and 56,209 tons respectively in 1917. The quantity of lead available for consumption in this country was about 540,000 tons, compared with 515,258 tons in 1917. In both years some of the available lead was shipped abroad for use of the American Expeditionary Force, but such shipments are not recorded as exports.

The production of primary spelter from domestic ores in 1918 was about 502,300 tons, and from foreign ores about 23,300 tons, a total of 525,600 tons, compared with 584,597 tons and 84,976 tons respectively and a total of 669,573 tons in 1917. Of the output of domestic spelter over 29,000 tons consisted of electrolytic spelter, including some that was refined from prime Western spelter. The exports of spelter made from foreign ores were about 24,400 tons and of spelter from domestic ores 78,600 tons, compared with 66,268 tons of foreign and 153,455 tons of domestic spelter in 1917. The stocks of spelter at smelters and in warehouses at the end of the year are estimated at 36,000 tons, and the apparent consumption during the year was about 440,000 tons, compared with 413,984 tons in 1917. The decrease in exports and the increase in apparent consumption is accounted for by the shipments for use of the American Expeditionary Force, which are not recorded as exports and hence appear as domestic consumption.

At the end of November 123,033 retorts were in operation at plants having a total of 165,060 retorts. The average quotation for prime Western spelter at St. Louis was 8 cents a pound compared with 8.9 cents in 1917.

Installation of a thaw house at its East Youngstown works is being completed by the Youngstown Sheet & Tube Co., Youngstown, Ohio. Difficulties encountered last year by freezing of raw materials, ore, coal, limestone and sand, prompted its erection. Use of dynamite in disintegrating the frozen masses proved costly, as railroad cars were frequently damaged.

Dr. Rossiter W. Raymond

Dr. Rossiter Worthington Raymond, eminent mining engineer, metallurgist, lawyer and author, died suddenly of heart trouble, Dec. 31, at his home in Brooklyn, N. Y. He was born in Cincinnati, April 27, 1840. His early education was secured in the common schools of Syracuse, N. Y., and in 1857 he entered the Brooklyn Polytechnic Institute, graduating from that institution, at the head of his class, in 1858. He spent the ensuing three years in professional study at the Royal Mining Academy, Freiberg, Saxony, and at the Heidelberg and Munich Universities.

Returning to the United States in 1861, he entered the Federal Army and served as aide-de-camp, with the rank of captain, on the staff of Maj.-Gen. J. C. Fremont, by whom, during his campaign in the valley of Virginia, he was officially commended for gallant and meritorious conduct.

From 1864 to 1868 he engaged in practice as a consulting mining engineer and metallurgist in New York City, and in the latter year was appointed United

States Commissioner of Mining Statistics, which position he held until 1876, issuing each year "Reports on the mineral resources of the United States West of the Rocky Mountains." In 1870, he was appointed lecturer on economic geology at Lafayette College, which chair he occupied until 1882. In 1873, Dr. Raymond was appointed United States Commissioner to the Vienna International Exposition, and as such delivered an address at the meeting of the Iron and Steel Institute, in Liege, Belgium.

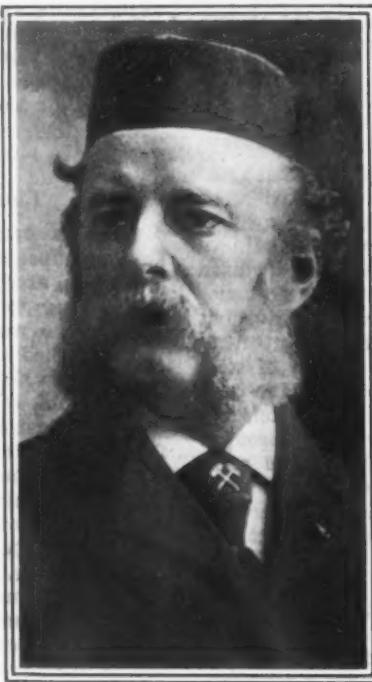
From 1875 to 1895, he was associated, as consulting engineer, with the firm of Cooper & Hewitt, owners of the New Jersey Steel & Iron Co., the Trenton Iron Co., the Durham and the Ringwood Iron works, as well as numerous mines of iron ore and coal. As president of the Alliance Coal Co. and director of the Lehigh & Wilkes-Barre Coal Co., as well as a personal friend of Franklin B. Gowen, he became acquainted with the inner history of the memorable campaign against the "Molly Maguires," and has since been known as a fearless opponent of all tyranny practiced in the name of labor. His articles on "Labor and

Law," "Labor and Liberty," etc., published in the *Engineering and Mining Journal* at the time of the Homestead riots, attracted wide attention, and for these, as well as similarly frank discussions of the operations of the Western Federation of Miners in Montana, Idaho and Colorado, he received special denunciations and threats from the labor unions thus criticised.

From 1885 to 1889, he was one of the three New York State Commissioners of Electric Subways for the City of Brooklyn, and served as member and secretary of the board. At the close of his official term as commissioner, he became consulting engineer to the New York & New Jersey Telephone Co.

In 1898, Dr. Raymond was admitted to the bar of the Supreme Court of New York State, and of the Federal District and Circuit Courts, his practice being confined to cases involving either mining or patent law, in the former of which he was a leading authority. In 1903, he was lecturer on mining law at Columbia University, New York.

An original member of the American Institute of Mining Engineers, he served as its vice-president in 1871, 1876 and 1877; president from 1872 to 1875, and secretary from 1884 to 1911, and in the latter capacity has edited the annual volume of *Transactions*, to which he has liberally contributed essays, especially pertaining to the United States mining laws, as well as other articles of importance. In editing this official publi-



DR. ROSSITER W. RAYMOND

cation of the Institute he reached a high standard of achievement. His remarkable personality has become a cherished memory of the many members of that body of men. He was the editor of the *American Journal of Mining* from 1867 to 1868, of the same periodical under the title *Engineering and Mining Journal* from 1868 to 1890, and continued thereafter a special contributor to that journal. In 1884 he prepared for the United States Geological Survey an historical sketch of mining law which was subsequently translated into German and published in full by the *Journal Des Bergrechts*, the only periodical in the world devoted exclusively to the subject of mining jurisprudence.

In 1911, during the visit to Japan of a party of members and guests of the American Institute of Mining Engineers, Dr. Raymond received from the Mikado the distinction of Chevalier of the Order of the Rising Sun—fourth class, the highest ever given to foreigners not of royal blood—"for eminent services to the mining industry of Japan." These services consisted in advice and assistance rendered in America to Japanese engineers, students and officials throughout a period of more than twenty-five years.

In 1912, he resigned his position as secretary of the American Institute of Mining Engineers, of which he has been since that time secretary emeritus.

Dr. Raymond was an honorary member of the American Philosophical Society, the Society of Civil Engineers of France, the Iron and Steel Institute and the Institution of Mining and Metallurgy of Great Britain, and various other technical and scientific organizations both at home and abroad. He received the degree of Ph.D. from Lafayette College in 1868, and that of LL.D. from Lehigh University in 1906 and from the University of Pittsburgh in 1915.

He married in Brooklyn, N. Y., March 3, 1863, Sarah Mellen Dwight of that city. He is survived by Mrs. Raymond and a daughter, Mrs. H. P. Bellinger of Syracuse, N. Y.

Ocean Freights Reduced

WASHINGTON, Jan. 7.—Reductions of from 25 to 30 per cent in existing freight rates from Atlantic ports to ports in South America, Asia, Japan, Australia and Africa are announced by J. H. Rosseter, director of operations of the Shipping Board, effective for January and February loadings.

Mr. Rosseter said this reduction in rates had been authorized in order that the substantial amount of tonnage under the Shipping Board, which has been made available for commercial trades, could serve its greatest possible usefulness to American exporters.

Puddlers' Wages Unchanged

YOUNGSTOWN, OHIO, Jan. 6.—During November and December the average sales price of bar iron was by selected mid-Western mills \$3.45 per 100 lb., thereby continuing wages of puddlers at \$16.80 per ton, it was disclosed at the bi-monthly settlement between representatives of the Amalgamated Association of Iron Steel and Tin Workers and the Western Bar Iron Association, James H. Nutt, secretary. The examination was conducted Jan. 3. The average sales price is the same as that for September and October, within 5c. of the Government maximum of \$3.50 base, established by the old price-fixing bodies.

The Inland Steel Co., Chicago, has taken steps to open branch offices in Detroit and Kansas City.

Major Joseph T. Speer

Major Joseph T. Speer, one of the oldest foundrymen in the Pittsburgh district, and well known in foundry circles all over the country, died at his home in the Hotel Anderson, Pittsburgh, on Sunday evening, Jan. 5, after a long illness. He had not been active in business for several years on account of ill health, and for some months was confined to his room.

Major Speer was born in Pittsburgh on Sept. 15, 1853, and attended the fourth ward public school in that city, and later the Western University, from which institution he was graduated. He then became connected with the firm of A. Speer & Sons, operating the Duquesne Plow Works, Pittsburgh, the firm being composed of Alexander Speer, father, and Joseph T. and W. W. Speer, sons. Major Speer traveled for this concern as salesman, covering Cuba and Mexico, among other territory, in the introduction of plows. On Nov. 1, 1900, the Pittsburgh Valve, Foundry & Construction Co., was organized in Pittsburgh, taking over the firm of A. Speer & Sons, Atwood & McCaffrey, and several other foundries and machine shops. Upon the organization of this company, Major Speer was elected vice-president, holding this position until Feb. 26, 1903, on which date he was elected president. On Feb. 24, 1915, he was elected chairman, succeeding Henry M. Atwood, who retired on account of ill health, and who desired to be relieved of the details of his office. Mr. Speer was chairman at the time of his death.

Major Speer was very active in the affairs of the American Foundrymen's Association, being vice-president from 1908 to 1909, and at the Pittsburgh meeting, held in 1909, he was elected president, serving two successive terms in the years 1910 and 1911. In 1912 he was elected an honorary member of the association. He was also active in the Pittsburgh Foundrymen's Association and served two successive terms as its president, in 1909 and 1910. He was not a member of any fraternities or clubs, but was a member for many years of the Trinity Protestant Episcopal Church in Pittsburgh, and was also a member of the Pittsburgh Chamber of Commerce. Major Speer was married in early life, but his wife died in 1886,

and he remained a widower.

Annual Meeting Rogers, Brown & Co.

The annual meeting of Rogers, Brown & Co. was held in Buffalo, Saturday, Dec. 21. Those in attendance were William A. Rogers and William T. Shepard, partners, of Buffalo; D. B. Meacham and J. K. Pollack, partners, of Cincinnati, and A. A. Fowler, partner, of New York; also the new partner, William S. Rogers, son of the senior partner and founder of the firm, William A. Rogers. The announcement of the admission of the new member into the firm was made at this meeting.

Among the sales representatives of the company present were R. T. Melville, F. J. Walde and A. F. Stengel, Buffalo; H. W. Fernald and F. E. Fitts, Boston; R. W. Clark, O. Arlt and J. A. Claussen, New York; G. R. Sullivan, Richard Peters, Jr., and S. B. Morrison, Philadelphia; William P. Cheney and T. A. Wilson, Pittsburgh; S. W. Hubbard and Harwood Wilson, Cleveland; F. W. Miller, F. W. Bauer, A. J. Wentworth, W. H. Knight and J. R. Moore, Cincinnati; A. O. Sonne and A. B. Weaver, Chicago, and Edward Gross, St. Louis.

In the evening all were entertained at the residence of William A. Rogers, 309 North Street.



MAJOR JOSEPH T. SPEER

CONTRACTORS ORGANIZE

Will Urge Congress to Take Action to Furnish Early Relief

Government contractors who are seeking to have informal War Department contracts validated by the Government formed a permanent organization in Cleveland, Jan. 3, and will make concerted efforts to have Congress enact legislation so that claims can be paid and paid quickly. The meeting was held at the Hotel Cleveland and was attended by about 250 contractors from all parts of the country, including representatives of some of the larger munition manufacturers. Claims aggregating in excess of \$1,500,000,000 are pending against the Government on informal war contracts entered into under the stress of war conditions, many of these being merely verbal, telephone or telegraph orders that resulted in a large expenditure by manufacturers for equipment and material with which to get started on Government work.

The meeting was called by the various Symington interests, the 75 mm. Shell Association, the American Fuse Manufacturers' Association and the Committee on Boosters and Adaptors.

W. S. Symington, Jr., president of the Symington-Chicago Corporation, presided and was later elected permanent chairman of the organization, which will be known as the Association of Manufacturers of War Material. Its objects as outlined by the chairman include the hastening of legislation to legalize so-called informal contracts, to expedite payments on account of the obligations of the Government and the final settlement of obligations of the Government to manufacturers. Henry H. Dineen, Maryland Trust Building, Baltimore, was appointed temporary secretary and for the present all communications are to be sent to him. A permanent secretary will be employed and the salary attached to the position will be sufficiently large to permit the association to secure the services of a capable man. The officers of the organization will also include a board of directors or governors to be named shortly by the chairman to consist of at least one active member from each Federal Reserve district, and one from Canada, and in addition an active executive committee appointed by the board of directors and empowered with such authority as the directors decide to bestow upon it.

The Situation Serious

The seriousness of the situation caused by the delay in the adjustment of war contracts and the possibility that the contractors may be unable to recover for an indefinite period money they have tied up in Government contracts was emphasized by the chairman or other speakers. Reference was made to the fact that informal contracts were taken in good faith during the wartime rush and the contractors had invested their money in material and equipment to fill the contracts. The opinion was quite generally expressed that the War Department was anxious to do the fair thing by the contractors. However, the claims cannot be adjusted until Congress passes the necessary legislation, as the Comptroller of the Treasury has ruled that the informal contracts place no obligation on the Government. The efforts of the members individually and of the organization will be directed towards members of congress, to whom personal appeals will be made that required legislation be enacted. Chambers of commerce, boards of trades and other organizations will also be asked to use their influence with the Senators and Representatives.

Various Bills Discussed

The various measures that have been introduced in Congress to validate the informal war contracts were discussed, but none was accepted as wholly satisfactory. These include the Dent bill now before the House, a bill drafted by the War Industries Board, the Hitchcock bill in the Senate and the Calder-Schneider bill that has been introduced in both branches. A press despatch from Washington to the effect that the Senate

Military Committee had rejected the recommendations of Secretary of War Baker for validation of informal contracts, had endorsed the Hitchcock bill and had added a clause placing adjustment in the hands of a non-interested commission was read, and the commission plan as endorsed by this committee met with instant and vigorous disapproval.

Charles A. Otis, Cleveland, who has been connected with the War Industries Board, expressed the assurance that the Government would give fair treatment to those who had gone to its assistance during the war emergency. He realized the seriousness of the situation and necessity for immediate action, adding that he had been in close touch with officials of the War Department and knew they were in sympathy with the efforts of manufacturers.

C. J. Symington, president Symington Machine Corporation, declared that the most important thing to do was to try to get quick action.

Resolutions Adopted

A committee appointed for the purpose presented a set of resolutions which were discussed at some length. The committee thought it unwise to favor any bill except possibly the pending Dent bill, which could be supplemented by additional legislation. After the discussion the slight amendments were made in the resolutions which were adopted as follows:

Resolved, That it is the sense of this meeting of manufacturers that Congress should immediately pass the Dent bill, with such amendments as may be needed to meet the present situation, legalizing the payment, through the present Government organization, of the obligations of the United States entered into in good faith by its accredited agents; and

Resolved, That the Claims Board should be instructed by the Secretary of War to take steps immediately to check the claims of sub-contractors; and

Resolved, That payment on account should be immediately made of such amounts, if any, as may clearly appear to be due.

The plan of appointing a legislative committee to be sent to Washington was discussed but abandoned. Government contractors in each large manufacturing center or district will appoint committees to take the matter up directly with their Congressmen and urge the immediate enactment of the desired legislation. A Cleveland committee was appointed which includes: H. B. Bole, Hydraulic Pressed Steel Co.; R. S. Hall, Bourne-Fuller Co., and H. C. Osborn, American Multigraph Co.

Meeting in New York

Representatives from 400 industries met at the Waldorf-Astoria Hotel, New York, Jan. 3, at the call of the Chamber of Commerce of the United States to discuss ways and means of adjusting war contracts and reconstruction problems affecting industry. A committee was appointed to get into immediate touch with the department officials in Washington in connection with the cancellation of war contracts by the Government and also to act as specialists in the various industries and to co-operate with the Government in the proper distribution of surplus war materials. The committee follows: W. L. Claus, president Pittsburgh Plate Glass Co.; L. S. Gillette, a steel fabricator of Minneapolis; William Butterworth, president Deere Plow Co., Moline, Ill.; A. C. Bedford, Standard Oil Co.; Holmer L. Ferguson, president Newport News Shipbuilding Co.; J. R. MacColl, Pawtucket, R. I., representing the textile industry, and C. H. Dowell, Armour & Co., Chicago.

Senate Committee Takes Unexpected Action

WASHINGTON, Jan. 7.—After recommending the Hitchcock bill to create a commission for the adjustment of unfinished war contracts, the Senate Military Affairs Committee has decided to withdraw that recommendation and to try to make an acceptable measure out of the Dent bill, scheduled for passage to-morrow by the House of Representatives under a special rule. Secretary Baker and Assistant Secretary Crowell of the War Department and Joseph Derfrees of Chicago,

representing the War Service Committee of the Chamber of Commerce of the United States, appeared before the Senate Committee and urged this action as the quickest way out of the tangle which has tied up 25,000 contracts and billions of dollars in adjustment.

The committee's action came as a surprise because last week it unanimously rejected the Dent bill. Opposition to the Hitchcock bill centered on the attempt to create a special commission to make the readjustments instead of leaving them to the Secretary of War.

Carbon Tool Steels and Their Use

Experiments which have been made by the Carnegie Steel Co., Pittsburgh, in its own machine shops and in actual use at its various works have indicated to that company that there are many purposes where a well-made carbon tool steel can be utilized in the manufacture of tools where heretofore alloy steels have been utilized. It has been possible by the use of carbon steels to reduce the cost of machine and other tools without material loss either in endurance or in speed of operation.

On the basis of these experiments the Carnegie Steel Co. is now prepared to offer to the trade a new line of tool steels in five grades, made in its electric furnace at the Duquesne works. These five grades contain different proportions of carbon, are suitable for different uses and in manufacture and shipment are distinctively designated by labels of different colors.

At present, in order to introduce the steels, and owing largely to the short length pieces ordinarily required, these steels will be marketed through Carnegie warehouses at Allston, Mass.; Newark, N. J.; Baltimore, Pittsburgh and Cleveland.

To introduce them the company has issued a new pamphlet, entitled "Tool Steels." The pamphlet is intended for the actual user of tool steels and, therefore, contains essential practical information without an extended discussion of the theories of heat treatment. The words "critical temperature" and "critical range" have been eliminated with all the theoretical discussions of austenite, troostite, sorbite, pearlite, cementite, etc., and their transformations which fill much of the current literature. In lieu of these designations reference is had to "line of hardening" and "minimum grain size," which, after all, are the essential points in the heat treatment of steels.

In standard works of reference on metallography and heat treatment it is possible to find figures illustrating the changes which take place in various kinds of steels under heat treatment. These, however, are as a rule steels of different carbon content, alloy steels, etc., so that a direct comparison is not possible. Illustrations of the Metcalf test pieces and the full-sized test piece fractures in the pamphlet are made from specimens treated and tested at the company's own shops for purposes of publication in this pamphlet and, therefore, admit direct comparison. The blacksmith who would test Carnegie electric tool steel No. 1 in the manner indicated should get identical results.

The chart of heat colors with its corresponding heat treating temperatures are in like manner based on carbon steels. Names of colors have been selected to conform to most general uses and are checked by indication of temperature in degree Centigrade and Fahrenheit. The chart of temper colors in the form presented is likewise entirely new. It is a direct reproduction of color photography from test pieces heat treated to the temperature shown. It affords a direct comparison by the blacksmith in the shop whereby it is possible to eliminate the effect of different lighting conditions.

The pages devoted to reproduction of labels also specify the various uses for each different grade of steel and permit the selection of the proper grade for any particular use with the least danger of the selection of the wrong kind of material.

The Peninsular Machinery Co., has moved its offices and wareroom from the Kerr Building to 279 East Jefferson Avenue, Detroit. The new quarters will enable the company to carry a larger line of machine tools.

The Australian Steel Industry

The secretary of the Broken Hill Proprietary Co., Ltd., Newcastle, Australia, in his report of the company's operation for the four weeks ended Sept. 18, 1918, gives the following data:

The one blast furnace now in operation produced 10,816 tons of pig iron. A second blast furnace will be completed upon the arrival of the turbo blower which has been shipped from England.

The furnace for foundry iron produced 2298 tons of foundry pig. The pig iron in stock consisted of 1940 tons of foundry pig and 4770 tons of pig iron for steel making.

On account of the restrictions on the export of steel, one-half of the open-hearth furnaces were closed down during a part of the four weeks' period, which resulted in a decrease in production, the total output being 12,470 tons.

The blooming mill produced 10,980 tons for plates and structural material, and the rail mill 4706 tons of rails.

In the merchant mills the 18-in. produced 2894 tons of structural shapes, the 12-in. 1700 tons, and the 8-in. 403 tons.

From the new rod mill which began operations on Sept. 2 about 50 tons of rails were produced each shift. Much of this product is sent to Melbourne to be drawn into wire for Australian consumption; 750 tons of the rods have been shipped since the mill started.

New Company to Make Electric Steel

The Commonwealth Steel Products Co., recently organized, has begun construction of a plant at Waratah, a short distance from the Newcastle steel works. An innovation in this section will be the installation of a 6-ton electric furnace, the raw material for which will be scrap iron and steel. This furnace will produce the steel for casting car-wheel centers and locomotive parts, and also ingots from which tires will be forged and rolled. The works will occupy about 47 acres, containing railroad sidings for the expeditious shipment of material.

The forging plant will contain the necessary reheating furnaces, three large forging hammers, and a tire rolling mill. It is stated that this will be the first mill in Australia to roll tires. All of the tools for machining and finishing will be of the most modern type. The company will manufacture a portion of the steel for its requirements, but will purchase blooms and ingots from other plants. Most of the machinery for the plant is being manufactured in Australia, but the electric equipment is being imported.

The necessary power for the electric furnace will be supplied by the Newcastle council in accordance with arrangements made by the council with the New South Wales Railway Department, which is at present constructing a new power house in Newcastle.

The principal building will be 210 ft. long by 125 ft. wide. It will consist of a main bay 60 ft. wide and two side bays. The main bay will be traversed its full length by an electric crane. A 20-ton electric crane will be installed over the railroad siding for the purpose of handling material.

Coal and Metal Briquetting Plant in New York

The General Briquetting Co., 25 Broad Street, New York City, is installing its new demonstration and custom briquetting plant at Fifty-seventh Street and Twelfth Avenue, New York.

This plant is designed to demonstrate on a commercial scale modern methods of briquetting metal, coal, flue dust, concentrates and other fine materials. The installation includes a Type A 325-ton hydraulic metal briquetting press adaptable to steel, brass, aluminum or other metal scrap; Belgian roll coal briquetting machinery; rotary toggle press, masticators, annealing ovens, dryers, elevator and conveyor system and power plant. It will commence operations about Feb. 1. It cost \$200,000.

H. K. Schoch, chemist, late of the Bureau of Standards, Washington, D. C., and George R. Cowan, briquetting engineer, late of Ellington Field, Texas, have resumed their positions with the General Briquetting Co.

The Vanadium-Alloys Steel Co., Pittsburgh and Latrobe, Pa., manufacturer of high speed and alloy tool steels, has leased the offices and warerooms at 566-568 West Randolph Street, Chicago, and will carry in that city a large stock of high speed steel in all the standard sizes and shapes of bar stock, also treated bits for tool holders.

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The Crying Need of Good Work

How many months or years must pass before it will be a common thing for work to be well done in the United States? The answer to this question will be in no small part the answer to the question, When will real prosperity come to the country?

The limitations as to food have been considered the chief war hardship in which the whole nation has shared; but the real universal hardship has been that imposed by the general prevalence of poor performance. On every hand there has been the breaking down of service which has become an indispensable part of every-day living. No one thing has been more noticeable in the past 18 months, or more talked about in every corner and center of the country, than "poor service." Nearly every contact of the average man with the complicated machinery which it has taken years to build up, to supply his necessities and to meet his demand for the conveniences and comforts of life, has furnished a fresh example of the failure of the machine or its operators to function properly. Houses have gone unheated for lack of coal, and such coal as could be had has told an unvarying story of defective quality and poor mining. Store, trolley line, steam railroad, hotel, elevator, telegraph, telephone, freight, express, postoffice—all have given daily evidences of derangement or breakdown.

The explanations have been generally of this tenor: The taking of four million young men away from their usual activities and sending them to battle fronts and camps, and all the dislocations of employment due to the setting of many more millions at tasks which were feeders of war put much of the country's work in new and incompetent hands. Then there were the slacking and the low morale induced by a war atmosphere and other causes often pointed out; also much poor performance resulting from war-time strain and the attempt of many men and women to carry on their own work and that of men who had gone to war.

So far as poor service is due to the causes just enumerated, it should now be in the way of being remedied. But there are evidences that the causes of much of the common failure to do good work are more likely to persist. With the extension of Government control has come a general lowering of standards. The idea that pay has no necessary re-

lation to performance has been given official sanction in the establishment of minimums representing the amount it was asserted a workman must have, in view of present cost of living. The same idea is at the base of all the Congressional opposition to time studies, bonus systems and other methods of establishing the right relation between wages and work done.

The word efficiency has fallen into disrepute. That is not so serious, for the word has been overworked. But it is a serious matter that there is widespread disfavor for the thing for which the word stands—namely, a high standard of performance both in quantity and quality. The reasons for this disfavor are both social and political. The fact that so many other jobs were open to a dissatisfied workman in war time has tended to lessen the sense of obligation to give an adequate return for wages. Paternalism has increased to such a degree that the Government is expected to stand and to make up for any and all deficiencies in individual effort. The spirit of grudging performance has grown to the extent that I. W. W. and Bolshevik leaven has spread.

Propaganda of many sorts has marked the years of the war. The period of readjustment will see much more. But none is more sorely needed than a propaganda for an increase of good will in industrial relations to the end that work may be well done. High wages—they are now the highest ever known—have not produced that very desirable condition. Time alone can tell whether the new democracy in industry can show the way.

Steel Sales and Contracts

The matter of the form of contract by which finished steel products shall be sold is again before the trade. The object is to provide a contract which cannot be canceled, thus stabilizing the trade by preventing overbuying and overselling. The chief feature of the proposed contract form is two paragraphs, one binding the seller to make deliveries and the other binding the buyer to furnish specifications, failure in either case to result in the payment of "liquidated damages," equal to the difference between the contract price and the market price at the time of the failure, but in no event to

be less than 5 per cent of the contract price.

Among both buyers and sellers there are found those who regard the contemplated reform as highly desirable. Likewise among both buyers and sellers there are found those who object strenuously to the proposed change. From buyers one hears the objection that by reason of competitive conditions it is necessary for the buyer to purchase far ahead when there is a "buying movement" on, but the buyer cannot tell so far ahead just how much material he will need, hence it cannot be certain that he will have occasion to specify all the tonnage the contract calls for when the time comes.

From some mills one hears the objection that the mill cannot tell in advance just what form the specifications of various buyers will take, hence the producer may eventually find himself with certain descriptions or sections of steel very heavily specified, but with other material, which he is equally capable of producing, but lightly specified. Hence the seller falls behind in the delivery of certain descriptions of material, merely because so many customers have chanced to specify much the same thing, yet the new contract form would require the payment of damages when such a condition arose.

These objections are convincing from one viewpoint and absolutely unconvincing from another. In one sense, they answer themselves. The buyer, in substance, asserts the right to buy when he does not know what he is going to want. The seller asserts the right to sell something he does not know whether he can deliver, and to a customer who may call for almost anything when the time comes, so long as it is measured by tons. It has been common, for instance, to make bar contracts under which the buyer could call for not only any bar section named in the list of extras, but also for bands. Now that hoops and bands are on the same card the sales practice might include hoops.

The discussion on this subject of contract reform will get nowhere if it does not recognize at the outset and throughout the discussion that the essence of any change that is made must be to reform the practice in making sales and purchases. The change in the form of contract is merely a means to an end. The real object of the reform is to prevent the buyer from making a purchase when he is not assured he will require the material, and to prevent the producer from making a sale when he is not certain he will be able to make the delivery. Are the buyers and sellers willing thus to limit themselves in their transactions, or are they unwilling?

It is not altogether fair to the average buyer under these contracts to assert that the practice in the steel trade hitherto has been that of giving options to buyers, as if the buyers were thereby given favors to which they were not entitled. There has been some measure of advantage to the producer in these contracts, or it is doubtful if the practice would have continued so general. In a normal market the practice has served to give the producer a good volume of specifications, enabling him to arrange rolling schedules advantageously. Under the proposed contract there would probably be more frequent changing of rolls, to avoid the payment of the "liquidated damages."

Roosevelt's Service to Business

Theodore Roosevelt was a big man and bigness in business had no terrors for him. He believed in great organizations and in encouraging legitimate enterprises of all kinds, but he was intensely opposed to anything that smacked of unfair dealing. He condemned wrong doing of all kinds in business, whether by small concerns or large, and the "malefactor of great wealth" came in for his special condemnation simply because the harm he did made more people suffer than the petty wrongs of the individual engaged in small transactions.

During the many years of his activity in public life, the one time in which Mr. Roosevelt became directly connected with the iron business was in the fall of 1907, when Judge Gary and H. C. Frick called upon him in connection with the proposed purchase of the Tennessee Coal, Iron & Railroad Co. by the Steel Corporation. In August, 1911, before the Stanley Congressional Investigating Committee and later in the dissolution suit, the then ex-President Roosevelt told the story of the much discussed visit. He stated that Judge Gary and Mr. Frick asserted that they did not wish to purchase the Tennessee company if he stated that it ought not to be done, and he said: "I answered that while, of course, I could not advise them to take the action proposed, I felt it no public duty of mine to interpose any objections."

A few paragraphs from the testimony of the ex-President are so thoroughly characteristic of him and show so clearly his conviction that he was entirely right, that they are worthy of perusal now. He said:

It was necessary for me to decide on the instant before the Stock Exchange opened, for the situation in New York was such that any hour might be vital, and failure to act for even an hour might make all subsequent effort utterly useless. From the best information at my disposal, I believed (and believe) that the addition of the Tennessee Coal & Iron property would only increase the proportion of the Steel Company's holdings by about 4 per cent, making them about 62 per cent instead of about 58 per cent of the total value in the country; an addition which by itself in my judgment (concurred in, I may add, not only by the Attorney General, but by every competent lawyer with whom I talked) worked no change in the legal status of the Steel Corporation.

Furthermore, I believed that the action was emphatically for the general good, that it offered the only chance for arresting the panic, and that it would probably arrest the panic, as it did. I answered Messrs. Frick and Gary, as set forth in my published letter, to the effect that I did not deem it my duty to interfere, that is, to forbid the action which more than anything else in actual fact saved the situation. The result justified my judgment. The panic was stopped; public confidence in the solvency of the threatened institution being at once restored.

Incidentally, I may mention that when I was in Birmingham last spring, every man I met, without exception, who was competent to testify, informed me voluntarily that the results of the action taken had been of the utmost benefit to Birmingham, and therefore to Alabama, the industry having profited to an extraordinary degree, not only from the standpoint of the business, but from the standpoint of the community at large, and of the wage workers, by the change in ownership. The results of the action I took were beneficial from every standpoint, and the action itself at the time when it was taken was vitally necessary to the welfare of the people of the United States.

In my judgment, I would have been derelict in my

duties, I would have shown myself a timid and unworthy public officer, if in that extraordinary crisis I had not acted as I did act. In every such crisis, the temptation to indecision, to non-action, is great, for excuses can always be found for non-action and action means risk and the certainty of blame to the man who acts. But if the man is worth his salt, he will do his duty, he will give the people the benefit of the doubt, and act in any way which their interests demand and which is not affirmatively prohibited by law, unheeding the likelihood that he himself, when the crisis is over and the danger passed, will be assailed for what he has done.

Colonel Roosevelt firmly believed in this case, as in many others, in giving the people the benefit of the doubt. While at times, in his advocacy of the referendum, the recall of judicial decisions and other measures, he was considered by many business men as well as by conservative leaders of his own party, to be socialistic in his tendencies, much that he said in support of such departures will be forgotten and the part of his career, as it relates to business, which will longest endure will be that in which he urged, early and late and with all the great vigor that he could command, that square dealing by big business and little business alike must be insisted upon and all kinds of crookedness be condemned and the guilty punished. He rendered this country a very great service in arousing antagonism to all unfair competition and in making it easier to conduct business in a thoroughly honorable manner.

Reviving the Sherman Law

The failure of the railroads to meet the demands of the country during the war was due to the fact that they were so crippled by the Sherman Law and by other national and state legislation that they could not come anywhere near using their equipment to the full extent. In other words, the Government had tied its own hands by many cords of legislation and the only way in which the cord could be cut was by an act which set aside all this legislation—the taking over of the railroads by the Government, so that they were absolutely controlled by one man, the director.

Now, when it is assured that hostilities are not to be resumed in Europe, opinions differ widely as to what ought to be done with the railroads. Some people believe in Government ownership; some in the early return of the properties to the companies, while others would retain the roads for five years, as proposed by Director Wm. G. McAdoo, but all who have studied the subject seriously are agreed on one point: that the properties should not be returned to their owners to be operated under the complicated system of state and national legislation by which they were hampered for years. It is universally conceded that if the railroads are to be privately owned or operated, they must be allowed more freedom, so that some of the best features of Government control as developed during the past year can be continued and perfected. The Association of Railway Executives, representing 92 per cent of the railway mileage of the country, has taken a stand against prolonging the control of the railroads by the Government and has announced that it will favor the enactment under

future private operation of a large part of the measures taken by the Government Railroad Administration during the war to co-ordinate and unify railroad facilities. Similar suggestions have been made by other organizations and by many individuals.

If, then, it is agreed that the railroads must be freed from too much legislation, what is to be done in regard to other lines of business? When the Government, in order to insure the winning of the war, assumed a large measure of control of the iron business and other lines of activity, it proceeded at once to throw the Sherman law into the discard, and not only permitted competitors to co-operate, but insisted that they do so. Co-operation was carried to an extent never dreamed of in the days of Gary dinners, and in some industries as, for example, the manufacture of cast iron pipe, all of the product required by the Government was sold to it through one agent who acted for all companies. Manufacturers were invited and urged to do the very things for which, a few weeks before, they would have been indicted.

After this policy had been continued for many months, business men naturally were interested to know what the policy of the Government would be in the future, and they have not been left in the dark long, for the Department of Justice has announced that dating from Jan. 1, concerted action in price fixing in any industry will be regarded as a restraint of free competition, which is one way of saying that prosecution will follow any action which seems to be a violation of the Sherman Law. This is really the only position that the Department of Justice could take, for as long as the law is on the statute books, it is bound to enforce it, but its announcement will doubtless renew the agitation in favor of the modification of the Sherman Law so as to permit reasonable co-operation in price fixing and other matters.

So far as the iron and steel trade is concerned, the Sherman Law will be obeyed, but the spirit of co-operation engendered first during the Gary movement following the panic of 1907 and later carried to a greater extent during the war will abide. The adoption of the new form of contract, which is expected to protect both buyer and seller and to discourage contracting for long periods, is one step in co-operation which officials are willing to permit and in time other plans may develop. It does not seem possible that the valuable experience recently gained will be lost, and there is much reason for hoping that distinct benefits will be derived from it. Possibly the most important result of that experience will be to show legislators how to modify the Sherman Law.

CORRESPONDENCE

Metal Cutting Tests with Stellite

To the Editor: In the Dec. 26, 1918, issue of your paper an article appears entitled "Stellite and High Speed Steel Compared," in which results are given of the comparative tests made by two Frenchmen on these two materials, these results having been published in the July issue of this year's *Revue de Metallurgie*. As

similar tests have been made by me as far back as 1914 and as the results found by me substantially coincide with those only recently published in France and in your magazine, I believe a brief résumé of my tests might not be without interest to the readers of your paper.

The tests which I conducted were made on a steel bar having a tensile strength of about 125,000 lb. per sq. in., and containing 0.45 per cent carbon and on medium cast iron. As the French experimenters record only tests made with a depth of cut 0.059 in. and a feed of 0.014 in., I shall show below only those of my tests which correspond approximately to these sizes of depth of cut or feed:

Experiment	Cutting Speed, Ft. per Min.	Depth of Cut, In.	Feed, In.	Length of Cut	Material Worked On
7	98.5	1/16	1/18	6 ft. 55 in.	Cast iron
8	66	1/8	1/18	12 ft. 40 in.	Steel
10	66	1/8	1/18	13 ft.	Steel
11	164	1/128	1/72	15 in.	Steel
13	98.5	1/128	1/72	4 ft. 45 in.	Steel
14	98.5	1/128	1/72	70 ft.	Steel

Experiment No. 14 was made with a high-speed steel having the same size and shape as the Stellite tool.

With regard to hardness it was found that that of Stellite as determined by the Shore scleroscope is 73-75; that of the high-speed steel, after it was hardened, 80-85 (before hardening 40). The Brinell hardness figure was 627 for Stellite and 700 for the hardened high-speed steel, which shows that the Stellite is softer than the high-speed steel—a conclusion confirmed by the French experimenters.

Stellite is more brittle than high-speed steel and in its cutting action behaves more like ordinary carbon tool steel than high-speed steel. It is well known that in a high-speed steel the wear starts some distance from the cutting edge and extends gradually to the edge, whereas in the case of Stellite and carbon steel the bluntness begins at the edge, which gradually rubs away; because of this, a Stellite tool will give more glaze or polish to the surface machined. On the other hand, the Stellite resembles high-speed steel as regards the sparks which it produces when ground on the emery wheel; its sparks are about just as red as those of high-speed steel, whereas carbon steel gives usually white or bright red sparks.

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Pro tempore. New York, U. S. A.

Conditions of Swedish Iron Industry

WASHINGTON, Jan. 7.—Commercial Attaché Erwin W. Thompson, at Copenhagen, Denmark, has sent to the Bureau of Foreign and Domestic Commerce the following interesting report on the after-war conditions of the Swedish iron industry taken from the *Svensk Handelstidning*:

"Sweden has a special position in the iron industry of the world. High qualities of iron are produced, and they are exported to all parts of the world. The general condition of the iron market has its influence on Swedish iron, especially on the iron ore export trade. Our greatest interest now is our export of quality iron. On account of the blockade, countries that formerly imported our iron have had to get along on their own resources. This has been done by electric refining processes which have been used greatly, especially in England and America. Sheffield, which for years was one of the most important users of Swedish steel, and which formerly had only three electric steel ovens, now has 80. The question is whether these electric ovens in the future will be able to compete with our Swedish steel. This electric iron industry is not a substitute industry, but something that has come to stay, and we will undoubtedly feel its competition, although it is a question whether in all ways it will be able to displace Swedish steel. We ourselves have a good basis for the electric processes in our waterpower. Our iron industries, however, are often located in places where great waterpower is not available. In this connection we

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may mention the building of the Dalalvens and Klaralvens waterpower, and the purchase by the middle Swedish iron industries of the Krangeforsarne and the general iron works at Lulea. However, we must not be blind to the danger that threatens our export market for quality steel, a danger that the war has brought very near to us.

"With regard to our own requirements of ordinary iron, we have long desired to cover it with our own production instead of with imports. It may be a question whether the possibilities for doing this have not been decreased by the war. Manufacture of ordinary iron must be based on important fuel, and it is probable that the high prices of this fuel will persist for a long time. To this difficulty must be added high transportation costs and a future depression of the iron market generally. It seems, therefore, that the largest part of our iron industry must continually follow its old traditions with regard to high quality, and that it must do everything in its power to further strengthen its historical leadership in this respect."

Large Dividends Paid

YOUNGSTOWN, Ohio, Jan. 6.—Dividends aggregating \$3,000,000 were distributed by corporations Jan. 1, constituting payments for the fourth quarter of 1918. This represented the largest dividend disbursement in the history of the Mahoning Valley. Three companies, Youngstown Sheet & Tube Co., Brier Hill Steel Co., and Trumbull Steel Co. paid out over \$2,000,000. The Sheet & Tube company paid 20 per cent on common for the year, Brier Hill the same and Trumbull 15½ per cent. Dividend policies for the year will in most cases be outlined by directors during the first quarter. Several executives have intimated that payments would be cut because of reduced earning power due to lower prices of iron and steel products.

PIG IRON OUTPUT EASES OFF

A Drop of 1040 Gross Tons Daily

A Net Loss of 10 Furnaces—Production for 1918 Amounted to 38,506,249 Gross Tons—Ferro- alloys in December Total 49,435 Tons

The pig iron production in December amounted to 3,433,617 gross tons or 110,762 tons daily as compared with 3,354,076 gross tons in November or 111,802 tons daily, a decline in output of 1040 tons daily. That the momentum of war effort still carried on, is shown by the fact that the December daily average exceeds the previous record for the month—103,333 gross tons in 1915—by over 7 per cent. On Jan. 1 there were 350 furnaces in blast with an estimated capacity of 109,675 gross tons, as against 360 stacks on Dec. 1 with a capacity of 111,330 tons. At the beginning of 1914 there were only 212 furnaces in blast, 147 in 1915, 295 in 1916, 311 in 1917, 321 in 1918. In the month of December 21 stacks were blown out and 11 blown in. Of ferroalloys 49,435 gross tons were produced, of which 25,528 tons was spiegeleisen.

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for each month and for the year 1918:

	Pig-Iron Production by Districts—Gross Tons			Year, 1918
	Oct.	Nov.	Dec.	
New York	231,286	222,253	231,848	2,539,047
New Jersey	14,466	20,560	18,462	239,004
Lehigh Valley	128,897	119,846	127,646	1,383,201
Schuylkill Valley	75,959	87,336	96,813	974,625
Lower Susquehanna and Lebanon Valleys	94,350	87,884	76,640	898,006
Pittsburgh district	702,690	662,644	687,265	7,824,648
Shenango Valley	181,094	173,784	153,918	1,918,960
Western Pennsylvania	184,888	178,440	171,252	2,183,587
Maryland, Virginia and Kentucky	91,899	87,667	90,386	1,092,470
Wheeling district	142,059	126,602	134,046	1,464,883
Mahoning Valley	337,165	320,295	330,388	3,578,836
Central and Northern Ohio	295,409	297,027	301,622	3,270,614
Southern Ohio	75,661	61,064	67,272	782,037
Chicago district	560,839	551,651	587,709	6,023,881
Mich., Minn., Mo., Wis., Col. and Wash.	128,091	120,100	119,518	1,419,202
Alabama	215,631	206,368	208,151	2,550,420
Tennessee	26,557	30,555	30,681	362,828
Total	3,486,941	3,354,076	3,433,617	38,506,249

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from December, 1917, is as follows:

	Daily Rate of Pig-Iron Production by Months—Gross Tons			Total
	Steel Works	Merchant	Total	
December, 1917	66,605	26,392	92,997	
January, 1918	55,662	22,137	77,799	
February	56,938	25,897	82,835	
March	74,526	29,122	103,648	
April	79,199	30,408	109,607	
May	81,238	29,937	111,175	
June	81,734	29,059	110,793	
July	79,248	31,106	110,354	
August	80,947	28,394	109,341	
September	83,579	30,363	113,942	
October	83,686	28,796	112,482	
November	83,395	28,407	111,802	
December	81,445	29,317	110,762	

The figures for daily average production, beginning with January, 1911, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1911—Gross Tons								
1911	1912	1913	1914	1915	1916	1917	1918	
Jan.	56,752	66,384	90,172	60,808	51,659	102,746	101,643	77,799
Feb.	64,090	72,442	92,369	67,453	59,813	106,456	94,473	82,835
Mar.	70,036	77,591	89,147	75,738	66,575	107,667	104,882	103,648
Apr.	88,836	79,181	91,759	75,663	70,555	107,592	111,165	109,607
May	61,079	81,051	91,039	67,506	73,015	108,422	110,238	111,175
June	59,585	81,358	87,619	63,916	79,361	107,053	109,002	110,793
July	57,841	77,738	82,601	63,150	82,691	104,017	107,820	110,354
Aug.	62,150	81,046	82,057	64,363	89,666	103,346	104,772	109,341
Sept.	65,903	82,128	83,531	62,753	95,085	106,745	104,465	113,942
Oct.	67,811	86,723	82,133	57,361	100,822	113,189	106,550	112,482
Nov.	66,648	87,697	74,453	50,611	101,244	110,394	106,859	111,802
Dec.	65,912	89,766	63,987	48,896	103,333	102,537	92,997	110,762

Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel com-

panies show the following totals of steelmaking iron month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

	Production of Steel Companies—Gross Tons				
	Total production		Spiegeleisen and ferromanganese		
	1916	1917	1918	1916	1917
Jan.	2,251,035	2,244,203	1,756,208	24,866	38,792
Feb.	2,183,845	1,829,846	1,620,254	23,877	32,137
Mar.	2,365,116	2,285,430	2,349,419	29,388	36,563
Apr.	2,316,768	2,370,937	2,411,188	31,862	39,595
May	2,408,894	2,404,380	2,513,577	35,844	37,701
June	2,295,784	2,304,155	2,407,166	38,597	30,829
July	2,306,303	2,369,630	2,456,693	31,353	43,884
Aug.	2,313,122	2,214,513	2,509,357	33,338	39,492
Sept.	2,309,710	2,198,705	2,507,381	29,451	42,235
Oct.	2,330,806	2,376,589	2,594,277	34,566	48,691
Nov.	2,404,210	2,349,545	2,501,867	44,975	34,688
Dec.	2,294,620	2,094,659	2,524,794	43,470	29,902

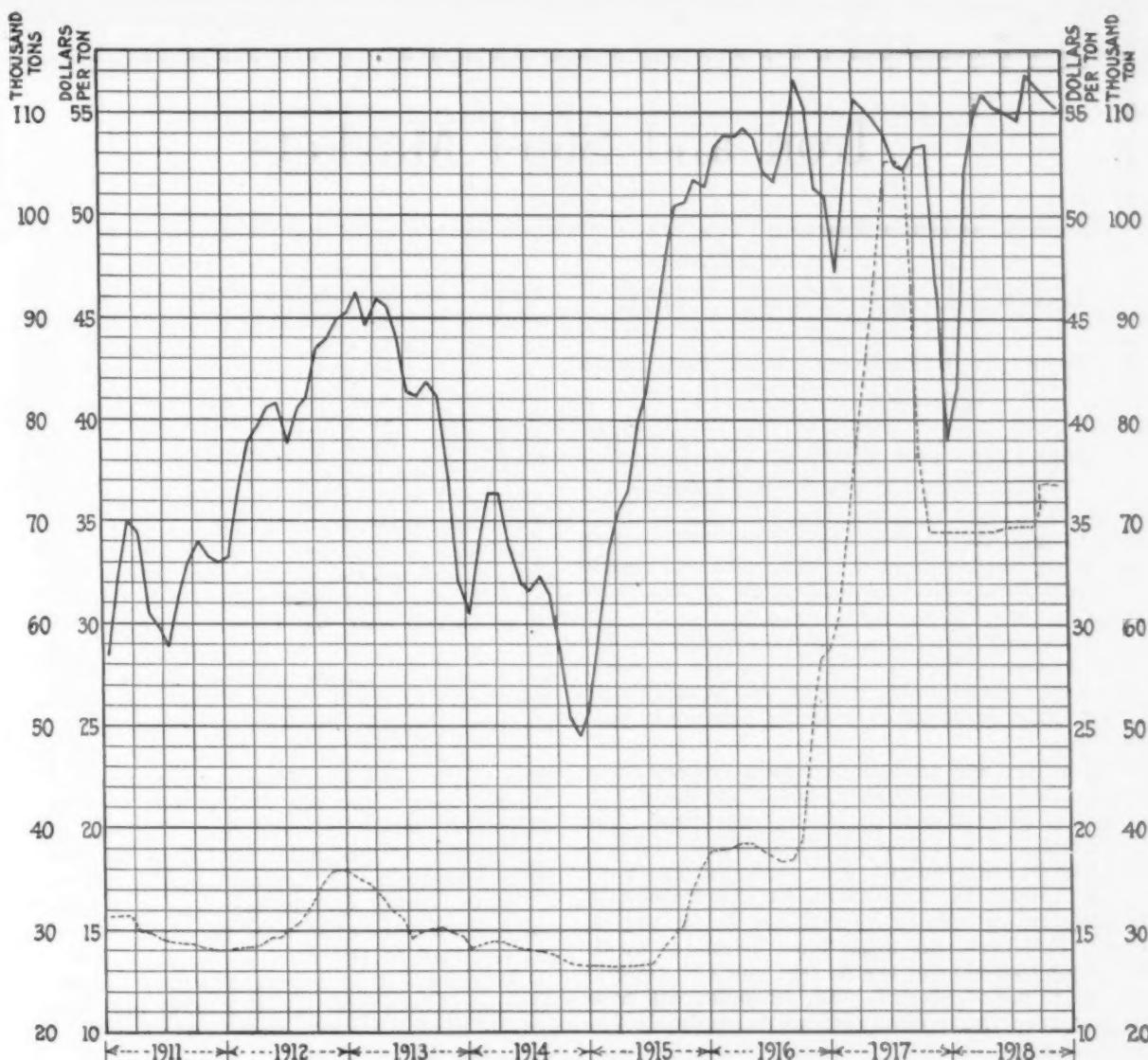
Capacity in Blast Jan. 1

The following table shows the number of furnaces in blast Jan. 1 in the different districts, also the number and daily capacity in gross tons of furnaces in blast Dec. 1:

Location of furnaces	Total number of stacks	Coke and Anthracite Furnaces in Blast	
		Jan. 1	Dec. 1
New York:			
Buffalo	21	18	6,450
Ferro	1	1	100
Other New York	3	4	650
Ferro	1	0	0
New Jersey	1	3	495
Ferro	1	0	0
Pennsylvania:			
Lehigh Valley	18	16	3,645
Spiegel	2	2	195
Schuylkill Valley	13	10	3,050
Spiegel	2	1	75
Lower Susquehanna	9	4	1,150
Ferro and Spiegel	2	2	95
Lebanon Valley	6	3	575
Ferro and Spiegel	4	2	150
Pittsburgh District	52	49	21,640
Ferro and Spiegel	5	3	530
Shenango Valley	19	17	5,075
Western Pennsylvania	25	21	5,410
Ferro and Spiegel	3	1	115
Maryland	4	3	950
Wheeling District	14	14	4,450
Ohio:			
Mahoning Valley	27	25	10,325
Central and Northern Ohio	26	25	10,025
Southern Ohio	17	14	2,200
Illinois and Indiana	40	39	18,860
Ferro	1	0	0
Michigan, Wisconsin, and Iowa	13	9	2,700
Col. Mo. and Wash.	7	4	1,100
Ferro	1	0	0
The South:			
Virginia	15	11	1,125
Ferro and Spiegel	4	3	120
Kentucky	5	5	750
Alabama	45	29	6,575
Ferro	1	1	95
Tennessee	16	11	1,000
Total	429	350	109,675
			360
			111,330

The furnaces blown out in December include the following, Niagara B in the Buffalo district; two Wharton in New Jersey; one Bethlehem in the Lehigh Valley; Nos. 3 and 4 Steelton in the Lower Susquehanna Valley; Bird Coleman, North Cornwall and B stack at North Lebanon, all in the Lebanon Valley; one Donora in the Pittsburgh district; one Johnstown and one Saxon in western Pennsylvania; No. 2 Haselton and No. 1 Hubbard in Mahoning Valley; one Central in northern Ohio, Belfont in the Hanging Rock Region; Miami in Chicago district, B stack in Colorado, Ironton in Washington, No. 3 Bessemer and Talladega in Alabama.

Among the furnaces blown in are one Lock Ridge in the Lehigh Valley, D stack of Edgar Thomson and one Eliza in the Pittsburgh district, Marshall in western Pennsylvania, Goshen in Virginia, one Grand Rivers in Kentucky, No. 1 Mingo in the Wheeling district, No. 4 Haselton in the Mahoning Valley, one River in Ohio, one Wellston in the Hanging Rock region, and No. 11 Gary in Indiana.



The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Price Per Ton of No. 2 Southern Pig Iron at Cincinnati, local No. 2 Iron at Chicago and No. 2X Iron at Philadelphia

Diagram of Pig-Iron Production and Prices

The fluctuations in pig-iron production from 1910 to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnace at Chicago, and No. 2X at Philadelphia. They are based on the weekly market quotation of THE IRON AGE.

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1914—Gross Tons

	1914	1915	1916	1917	1918
Jan. . .	1,885,054	1,601,421	3,185,121	3,150,938	2,411,768
Feb. . .	1,888,670	1,674,771	3,087,212	2,645,247	2,319,299
Mar. . .	2,347,867	2,063,834	3,337,691	3,251,352	3,213,091
Apr. . .	2,269,655	2,116,494	3,227,768	3,334,960	3,288,211
May . . .	2,092,688	2,263,470	3,361,073	3,417,340	3,446,412
June . . .	1,917,783	2,380,827	3,211,588	3,270,055	3,323,791
July . . .	1,957,645	2,563,420	3,224,513	3,342,438	3,420,988
Aug. . .	1,995,261	2,779,647	3,203,713	3,247,947	3,389,585
Sept. . .	1,882,577	2,852,561	3,202,366	3,133,954	3,418,270
Oct. . .	1,778,186	3,125,491	3,508,849	3,303,038	3,486,941
Nov. . .	1,518,316	3,037,308	3,311,811	3,205,794	3,354,074
Dec. . .	1,515,752	3,203,322	3,178,651	2,882,918	3,433,617
Total.	23,049,752	29,662,566	39,039,356	38,185,981	38,506,249

*These totals do not include charcoal pig iron. The 1917 production of this iron was 376,525 tons.

The Mahoning Foundry Co., Youngstown, Ohio, has placed contracts for some of the equipment for its new foundry. It is still in the market for an air compressor, tumbling mills and duster rester. J. W. Long is the manager, to whom proposals for new equipment should be sent.

Lukens Steel Co. New Plate Extras

The Lukens Steel Co., Coatesville, Pa., has issued a new card of steel plate extras, which is practically identical with that adopted by the Midvale Steel & Ordnance Co., Philadelphia, and published on page 92 of the Jan. 2 issue of THE IRON AGE, except that the Lukens Steel Co. publishes differentials for plates wider than 145 in., these being as follows:

Widths over 145 in. to 150 in., inclusive .1.75c. per lb. extra
 Widths over 150 in. to 155 in., inclusive .2.00c. per lb. extra
 Widths over 155 in. to 160 in., inclusive .2.25c. per lb. extra
 Widths over 160 in. to 165 in., inclusive .2.50c. per lb. extra
 Widths over 165 in. to 170 in., inclusive .2.75c. per lb. extra
 Widths over 170 in. to 175 in., inclusive .3.00c. per lb. extra
 Widths over 175 in. to 180 in., inclusive .3.25c. per lb. extra
 Widths over 180 in. to 185 in., inclusive .3.50c. per lb. extra
 Widths over 185 in. to 190 in., inclusive .3.75c. per lb. extra
 Widths over 190 in. to 195 in., inclusive .4.00c. per lb. extra

By-product Ovens Built

PITTSBURGH, Jan. 7.—(By wire).—An addition of 30 by-product coke ovens has been completed by the Koppers Co. for the Indiana Coke & Gas Co. in Terre Haute, Ind. These ovens were placed in operation on Jan. 1. Construction work was commenced in May, 1918. The plant of the Indiana Coke & Gas Co. now consists of 60 ovens with by-product recovery apparatus and benzol plant. Indiana coals are used.

At the banquet, superintendent's night, Saturday, Dec. 21, given by the Machinery Club of Chicago, 750 men, representing the machinery construction and metal working interests of the Middle West, amidst high enthusiasm, proclaimed Charles M. Schwab their presidential choice for 1920.

Iron and Steel Markets

MARKET MARKING TIME

No Signs of Price Recessions But Some Contract Revisions

Pig Iron Production 38,506,249 Tons in 1918— Export Trade Needs Shipping Pool

A slight increase in the volume of business marks the first week of the new year. No significance can be attached to the fact, for there are no signs as yet of a buying movement.

A few steel departments are operating at 85 per cent of capacity, but the general average is nearer 65 per cent. At that the present rate of production is equivalent to 90 per cent of the capacity of four years ago.

Consumer and producer are each settling down to a contest to tire out the other. The one is convinced at present that prices will go lower. The other claims it would be disastrous if they did, unless wages are reduced. But labor readjustment except through the long drawn out process of men bidding against one another is not as yet considered. The increasing needs must be shored up by the buying element of the market and an unwavering adherence to present price schedules will have to dominate the selling element to maintain the deadlock.

Revisions of steel contracts to present levels have been made, even on material for specific projects, but generally they represent concessions in return for greatly delayed deliveries last year and to jobbers and fabricators for resale. Reductions of sheet contract prices on sales under the presumably ironclad contracts peculiar to that trade weaken the chances of wide introduction of the recently approved form of the general iron and steel contract.

In the pig iron market the tendency to reduce prices on undelivered tonnages is noted in some districts, as in Cleveland, where one company is freely revising contracts, but many large sellers have not yet decided to follow this policy except in rare cases and a compromise frequently adopted is to extend deliveries instead of granting cancellations or price revisions. Many foundries have little business on hand and are not confident as to prospects.

An organization of war contractors has been effected at Cleveland to urge prompt settlement of claims aggregating \$1,500,000,000 for war work performed on informal contracts, many of which were merely telephone orders. In the matter of written pig iron contracts, there is talk of transferring them to the Ordnance Department if the iron maker refuses to cancel or to accept a cash consideration in lieu of delivery, thus to leave the producer to deal with the War Department.

Export business is developing slowly, due to questions of price and also to the scarcity of ships and high freight rates. The United States Shipping Board has begun to release ships for commercial trade, but it will be some months before the

number will be sufficient. What is regarded as essential is some international pooling of shipping, so that ships leaving here may be assured of cargoes on continuing voyages. In no other way is explained the making of ocean rates from United States ports two and three times those from British ports, a condition which puts our exports at a decided disadvantage. A reduction of 25 to 30 per cent in vessel freight charges has certainly not stimulated an export movement.

The pig iron production of 1918 was 38,506,249 tons. The December output was 3,433,617 tons, or 110,762 tons daily, and thus at an annual rate of 40,428,000 tons, but there were five months of last year in which a higher rate was maintained. The momentum of war effort is responsible in part, for December, 1918, exceeded the existing December record, that of 1915, by 7429 tons a day. The severe winter of 1917-1918 cut down the year's total. The November daily average make was 111,802 tons. The pig iron output of 1917 was 38,185,981 tons and of 1916, 39,039,356 tons.

The rate of production on Jan. 1, however, was 109,675 tons per day, against 111,330 tons on Dec. 1. In the month 11 furnaces came in, but 21 went out and the number in blast on Jan. 1 was 350, or ten less than on Dec. 1.

Munitions makers have placed a considerable tonnage of tool steel on the market for resale and this is having a weakening effect, causing prices to be shaded.

Several thousand tons of borings and turnings for blast furnace burdens have been sold at \$12, delivered, and sales this week point to about \$11.

Pittsburgh

PITTSBURGH, Jan. 7.—(By Wire.)

The transition period in the steel trade is still under way, prices showing a steady tendency toward lower values with consumers and jobbers still holding off placing new orders except for such material as they absolutely need. A readjustment is also going on in contracts made last year between the mills and consumers and jobbers, at higher prices than are ruling now and the work of readjusting these contracts will take some time to complete. Various opinions are being advanced as to how long it will be before a genuine buying movement will take place in the steel trade, and sentiment is pretty strong that this can not be expected under present conditions for some months, possibly not before July. Not enough material in pig iron, semi-finished steel or finished steel products is being sold to firmly establish prices. The mills do not look for any great decline, basing this opinion on present high costs, which they claim will not permit of any radical decline in prices.

A general movement to reduce wages is not expected for some time, and no one concerned seems willing at present to take the initiative in such a movement. The usual way heretofore when the mills found it necessary to reduce prices on their products was to reduce wages, but labor conditions now are vastly different than they were a few years ago. Then the standard price of ordinary labor was about \$1.50 per day, but now it is ranging from \$4.50 to \$5 per day. Should a surplus of labor develop, say two men for each man's job, it is not unlikely the situation would then take care of itself.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

	Jan. 7,	Jan. 1,	Dec. 10,	Jan. 9,
Pig Iron, Per Gross Ton:	1919	1919	1918	1918
No. 2 X, Philadelphia...	\$36.15	\$36.15	\$39.15	\$34.25
No. 2, Valley furnace...	31.00	31.00	34.00	33.00
No. 2 Southern, Cin'ti...	34.60	34.60	37.60	35.90
No. 2, Birmingham, Ala...	31.00	31.00	34.00	33.00
No. 2, furnace, Chicago*	31.00	31.00	34.00	33.00
Basic, del'd, eastern Pa...	33.90	33.90	36.90	33.75
Basic, Valley furnace...	30.00	30.00	33.00	33.00
Bessemer, Pittsburgh...	33.60	33.60	36.60	37.25
Malleable Bess., Ch'ga*	31.50	31.50	34.50	33.50
Malleable Valley...	31.50	31.50	34.50	33.50
Gray forge, Pittsburgh...	31.40	31.40	34.40	32.75
L. S. charcoal, Chicago...	38.85	38.85	38.85	37.50

Billets, etc., Per Gross Ton:

Bess. rails, heavy, at mill.	\$55.00	\$55.00	\$55.00
O.-h. rails, heavy, at mill.	57.00	57.00	57.00
Bess. billets, Pittsburgh...	43.50	43.50	47.50	\$47.50
O.-h. billets, Pittsburgh...	43.50	43.50	47.50	47.50
O.-h. sheet bars, P'gh...	47.00	47.00	51.00	51.00
Forging billets, hase, P'gh.	56.00	56.00	60.00	60.00
O.-h. billets, Phila...	47.30	47.30	51.30	50.50
Wire rods, Pittsburgh...	57.00	57.00	57.00	57.00

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	3.145	3.145	3.745	3.685
Iron bars, Pittsburgh...	2.90	2.90	3.50	3.50
Iron bars, Chicago...	3.17	3.17	3.50	3.50
Steel bars, Pittsburgh...	2.70	2.70	2.90	2.90
Steel bars, New York...	2.97	2.97	3.17	3.095
Tank plates, Pittsburgh...	3.00	3.00	3.25	3.25
Tank plates, New York...	3.27	3.27	3.52	3.445
Beams, etc., Pittsburgh...	2.80	2.80	3.00	3.00
Beams, etc., New York...	3.07	3.07	3.27	3.195
Skelp, grooved steel, P'gh.	2.70	2.70	2.90	2.90
Skelp, sheared steel, P'gh.	3.00	3.00	3.25	3.25
Steel hoops, Pittsburgh...	3.30	3.30	3.50	3.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheet, black, No. 28, P'gh.	4.70	4.70	5.00	5.00
Sheets, galv., No. 28, P'gh.	6.05	6.05	6.25	6.25
Wire nails, Pittsburgh...	3.50	3.50	3.50	3.50
Cut nails, Pittsburgh...	5.00	5.00	5.00	4.00
Fence wire, base, P'gh...	3.25	3.25	3.25	3.25
Barb wire, galv., P'gh...	4.35	4.35	4.35	4.35

Old Material, Per Gross Ton:

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Carwheels, Chicago	\$26.00	\$26.00	\$27.00	\$30.00
Carwheels, Philadelphia	25.00	25.00	29.00	30.00
Heavy steel scrap, P'gh.	20.00	22.00	26.00	30.00
Heavy steel scrap, Phila.	18.00	18.00	26.00	30.00
Heavy steel scrap, Ch'go.	18.00	19.00	26.00	30.00
No. 1 cast, Pittsburgh...	25.00	27.00	27.00	30.00
No. 1 cast, Philadelphia...	24.00	24.00	29.00	30.00
No. 1 cast, Ch'go (net ton)	24.00	25.00	26.00	26.00
No. 1 RR. wrot, Phila...	25.00	25.00	34.00	35.00
No. 1 RR. wrot, Ch'go (net)	21.50	21.50	27.00	31.25

Coke, Connellsville,

Per Net Ton at Oven:	\$6.00	\$6.00	\$6.00	\$6.00
Furnace coke, prompt	\$6.00	6.00	6.00	6.00
Furnace coke, future	6.00	6.00	6.00	6.00
Foundry coke, prompt	7.00	7.00	7.00	7.00
Foundry coke, future	7.00	7.00	7.00	7.00

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	21.00	23.00	26.00	23.50
Electrolytic copper, N. Y.	21.00	23.00	26.00	23.50
Spelter, St. Louis	7.50	7.65	8.25	7.62 1/2
Spelter, New York	7.85	8.00	8.60	7.87 1/2
Lead, St. Louis	5.45	5.70	6.75	6.55
Lead, New York	5.75	6.00	7.05	6.70
Tin, New York	71.50	71.50	72.00	85.00
Antimony (Asiatic), N. Y.	7.62 1/2	7.62 1/2	8.50	14.50
Tin plate, 100-lb. box, P'gh	\$7.35	\$7.35	\$7.75	\$7.75

Until there is a surplus in labor supply, it will be a very hard matter to reduce wages.

The only important change in the steel market of the past week, as regards prices, was a decline of \$2 to \$3 a ton on nearly all kinds of scrap with very little material moving from dealers to consumers.

Pig Iron.—Conditions in the pig iron trade at this writing show no change from those noted in our report last week, with the exception that a little more iron is being offered for resale by consumers who find they are over bought since the Government canceled contracts for war materials. Considerable basic iron is being offered for resale, and several small lots of Bessemer have come out in the past week, but consumers seem well covered and are not willing to buy iron even at the prices at which it is offered, which in several cases have been below what are regarded as general market prices. There is still a scarcity in supply of blast furnace coke, and this is keeping down output of pig iron to some extent. Prices under contracts made last year are still under process of adjustment. In some cases, the consumer has paid the furnace a flat price per ton for cancellation of the contract; in other cases, furnaces have agreed to hold up shipments until such time as the consumer can take the iron, but at the same time the sellers insist that the contract must be kept alive and the consumer finally take in the iron. Two or three small lots of Bessemer and basic have been sold in the past week on the basis of \$32.20 or lower for Bessemer, and \$30 or lower for basic. It is expected to be some time before there will be a general buying movement in pig iron.

Basic pig iron, \$30; Bessemer, \$32.20; gray forge, \$30; No. 2 foundry, \$31; No. 3 foundry, \$30.50, and malleable \$31.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh district being \$1.40 per ton.

Ferroalloys.—The local market on all grades of ferroalloys is extremely quiet, and some material, notably in ferromanganese and ferrosilicon, is being offered for resale. Consumers seem to be stocked up

for some months and it will likely be some time before they come in the market. Prices on ferroalloys are not strong and unless demand soon improves, a lower market is expected.

We quote 70 per cent ferromanganese at \$225, delivered, and 16 to 18 per cent spiegeleisen, \$65, f.o.b. furnace, an addition or deduction of \$3.50 per unit being made, when the manganese content is above or below the standard. For delivery over the remainder of the year, and for next year, 50 per cent ferrosilicon is quoted at \$125.

We quote 9 per cent Bessemer ferrosilicon at \$52; 10 per cent, \$54; 11 per cent, \$57.30; 12 per cent, \$60.60. We quote 6 per cent silvery iron, \$39; 7 per cent, \$40; 8 per cent, \$42.50; 9 per cent, \$44.50; 10 per cent, \$47. Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of \$2.90 per gross ton, for delivery in the Pittsburgh district.

Plates.—Demand is extremely quiet and none of the large consumers of plates is taking the usual quantity, owing to falling off in orders. The two local steel car companies, prior to the time the armistice was signed, were running nearly 100 per cent on war materials. The contracts for these have been canceled or held up by the Government, and no new orders are being placed for steel cars. The work of adjusting contracts of plates placed last year is still under way and one large producer is understood to have practically canceled all contracts made last year at the higher prices and agreed to fill these at to-day's market. The entire output of the Liberty plate mill of the Carnegie Steel Co. is now available for commercial purposes.

We quote sheared plates at 3c., Pittsburgh mill.

Billets and Sheet Bars.—The local market in semi-finished steel in the forms of billets and sheet bars is extremely dull and so far as known no contracts are being made. Consumers expect the mills to further reduce their prices on billets and sheet bars, but the mills say at the present high costs, prices of steel are low enough. Large quantities of sheet steel discards, also shell steel bars and billets, are being offered in this market and at relatively low prices. The tin plate trade

is quiet, the mills operating at only 50 per cent of capacity, and this is cutting down consumption of sheet bars considerably. The sheet mills are doing a little better, operating at 60 or 70 per cent of capacity, but whether this rate of operation can be maintained is a question. There is an ample supply of sheet bars for all purposes, and in some cases consumers have asked for suspended shipments, or else that shipments be cut down as their stock of steel is getting too heavy.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at \$13.50, sheet bars \$47, slabs \$46, and forging billets \$56 base, all f.o.b. at mill, Pittsburgh, or Youngstown.

Structural Material.—No new commercial work is being placed, and the Government has canceled or held up nearly all contracts in existence with local fabricators. Capital does not seem to believe it is an opportune time to make investments in the construction of large buildings, and the railroads are also out of the market, placing only such new work as is absolutely necessary.

We quote beams and channels up to 15 in. at 2.80c. at mill, Pittsburgh.

Iron and Steel Bars.—New demand for both iron and steel bars is extremely small, consumers evidently waiting for lower prices, which they seem certain will be named by the mills before long. Some of the mills rolling iron bars are reported to be getting short of work.

We quote soft steel bars rolled from billets at 2.70c. from old steel rails, 2.80c.; common iron bars, 2.90c.; bar iron rolled from selected scrap, 3.65c.; and refined iron bars at 4.40c. at mill, Pittsburgh.

Sheets.—The rate of operation among the sheet mills is 60 to 70 per cent of capacity and with the supply of sheet bars ample for all needs. The output of sheets is larger at present than before the war ended. However, shipments of sheets by the mills now are almost entirely for commercial uses, and whether the commercial demand will continue heavy enough to allow the mills to operate at present rate is a question. Jobbers report fairly heavy stocks, and do not seem inclined to buy very freely, placing orders only for such quantities and gages of sheets as are needed to round out stocks. Both jobbers and consumers seem to have taken the position that present prices of sheets will not be minimum of the market later on and are holding off placing orders. Prices on sheets are given in detail on page 153.

Tin Plate.—At present the tin plate mills are not operating more than 50 per cent capacity, some being partially closed for inventory and repairs and also because contracts have been pretty well cleaned up. There is some export inquiry on which the mills are still quoting about \$7.75 per base box at mill. We quote tin plate at \$7.35 per base box for domestic trade, f.o.b. at mill.

Wire Rods.—Demand is quite in sympathy with the market on wire products, which is always dull at this season of the year. Consumers of rods insist that some reduction in price should have been made, when other forms of finished steel were reduced, but makers state that based on present prices of steel, rods and wire products are low, and allow only a small profit. Soft Bessemer and open-hearth rods are \$57, rivet rods \$62, while prices on high-carbon rods are arbitrary, ranging from \$70 upward, all f.o.b. Pittsburgh. Prices are given on page 153.

Wire Products.—Buying in wire and wire mills by jobbers and consumers is reported by the mills to be fairly active, but is largely confined to actual needs, both jobbers and consumers taking the position that the mills may not be able to maintain present prices on wire products, and that they may be able to place orders later on at lower figures. Makers state that prices on wire nails and wire from the time the Government controlled the market were very low, and did not permit the margin of profit secured in other lines of steel products. All the mills report they are holding firmly for regular prices in effect prior to Jan. 1, and are not taking any orders at lower figures. These prices are given in detail on page 153.

Hot-Rolled Strip Steel.—Makers of hot-rolled strip steel, as made by the hoop and band mills, are quoting 3.30c. per lb. Pittsburgh, while hot-rolled strip steel of special stamping quality is 3.80c. per lb. New business being placed is small. A good deal of material remained to be shipped on old contracts at higher prices than now prevail. It is said some of these contracts have been adjusted to the new and lower price.

We quote hot rolled strip steel, as made by hoop and band mills, at 3.30c. per lb., and as made for special stamping purposes at 3.80c. per lb., f.o.b. Pittsburgh.

Cold-Rolled Strip Steel.—Makers report that about the only new buying being done is by the automobile trade and that is not very heavy. Jobbers are not placing orders freely, desiring to test the market before stocking up. A heavier demand is expected after Jan. 15, or later.

We quote cold-rolled strip steel at \$6.25 base per 100 lb., f.o.b. Pittsburgh, for 1 1/2-in. and wider, 0.100 in. and thicker, hard temper in coils under 0.20 carbon. Boxing charge 25c. per 100 lb.

Shafting and Screw Stock.—A new list of extras has been adopted by the finishing makers, the principal change being that the former charge of 20c. for boxing for domestic or export shipment has been increased to 30c. for domestic and 40c. for export. The former extra of 15c. charged for cutting 3/4-in. and under to lengths has been eliminated. New business is light, but makers believe that about Jan. 15, or shortly after, demand will be heavier. The automobile trade is placing some orders, but jobbers are not buying.

We quote cold-rolled shafting at 20 per cent off list in carloads and 16 per cent in less than carloads, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets.—Makers have not made any reduction in price, and say they do not expect to do so. They point out that prices on nuts, bolts and rivets were under Government control from Nov. 14, 1917, and until the time the market was declared open Jan. 1, there was no advance made in price, though during that time wages advanced 50 to 60 per cent and there were heavy advances in materials. These are the reasons they say that they will not reduce prices. New business being placed is only fair in volume, but is said to be as heavy as usual at this season, which is always dull. Discounts are given on page 153.

Spikes.—Makers report that several railroads recently came in the market with inquiries but did not buy, stating they would hold off until assured that prices would not be any lower. There is no new demand for small spikes.

We quote standard spikes 9/16 x 4 1/2 in. at \$3.65 and small spikes at the same price in carload lots of 200 kegs or more at \$3.65 per 100 lb., plus usual extras. We quote boat spikes at \$5.00 base per 100 lb. plus usual extras, in carload lots of 200 kegs or more, all f.o.b. Pittsburgh.

Rivets.—Makers report that new business is very light, consumers and jobbers not placing orders freely until satisfied that prices will not be lowered. It is said some large Government contracts have been canceled, as the material will not be needed.

We quote button head structural rivets at \$4.40 and cone head boiler rivets at \$4.50 base, f.o.b. Pittsburgh.

Hoops and Bands.—Demand is quiet, the makers reporting that specifications against contracts made at the old and higher prices are not coming in very freely. Buyers insist these contracts must be adjusted to the basis of the new and lower prices.

We quote steel hoops and bands at 2.30c. base, carrying the usual extras.

Skelp.—Mills rolling skelp for the open market report the demand very quiet.

We quote grooved skelp at \$2.65, universal skelp \$3.00 base. Special skelp for boiler tubes, etc., is \$3.15 for bases size and \$3.30 for other sizes, all these prices being per 100 lbs., f.o.b. Pittsburgh.

Wrought Pipe.—All the mills rolling iron and steel pipe are now quoting the discounts adopted on Jan. 1, which show a reduction of \$6 per ton from former prices. There are still some large Government contracts on the books of the mills for iron and steel pipe, which have not yet been canceled, but likely will be in the near future, as it is not expected the Government will specify on contracts for either iron or steel pipe that it cannot use. A fair amount of new business is

being placed by jobbers, one mill receiving an order recently for 1500 tons of steel pipe for early delivery at the new discount. The mills expect that this year large contracts for line pipe will be placed, as there was very little done last year in the laying of new oil or gas lines, owing to the scarcity of labor and also of pipe, which could not be had for these purposes. Discounts on iron and steel pipe, as effective from Jan. 1, are given on page 153.

Boiler Tubes.—Makers report the demand for both iron and steel tubes is very light. It develops that the discount on 3½ and 4½ in. charcoal iron tubes, which was 12½ per cent, was very light, based on the price of steel. Because of this, several makers have decided not to reduce prices on these sizes of charcoal iron tubes, and so they will continue to quote the old discount of 12½ per cent. Discounts on iron and steel tubes are given on page 153.

Coke.—We note there is still a scarcity in the supply of prompt furnace coke, some furnaces running very close to shore, and unless shipments soon improve, some stacks will have to bank. During December, the output of pig iron in the Pittsburgh and near-by districts was cut down a good deal owing to scarcity of coke, three or four furnaces being idle nearly the entire month. The New Year holiday again cut down output last week, but it is believed that from this time on production of coke will materially increase. The Fuel Administration is still in control of prices, but whether this will continue is not known. The output of coke for the week ending Dec. 28 showed an increase over the previous week of 4000 to 5000 tons, but production is still 50,000 to 75,000 tons less than normal.

We quote 48 hr. beehive blast furnace coke at \$6; 72 hr. beehive foundry coke at \$7 and crushed coke over ¼ in. at \$7.30, all in tons of 2000 lb. at oven. We quote by-product coke at \$5.70 for run of ovens and \$6.70 for selected foundry in all States but Alabama and Washington. To these base prices should be added the freight rate from the competing beehive coke district which takes the lowest freight rates to the point where such by-product coke is produced, except that there shall be added for coke manufactured in New England 7c. for each 5c. above 60c. in the freight charges per ton (2240 lb.) of coal for water transportation on the coal used in the manufacture of such coke.

Old Material.—Dealers continue to report stagnation in the local scrap market, and not enough material is being sold by any means to firmly establish prices. Stocks held by consumers are very heavy and a general buying movement is not expected until these stocks have been pretty well worked off. Very large quantities of scrap are still being offered for sale in this market by our own Government and also by Canada, and this is having the effect of weakening prices, which this week are from \$2 to \$3 per ton lower than last week. Reports are made of sales of 1500 to 2000 tons of heavy steel scrap for open-hearth furnaces for fairly prompt delivery at about \$20 per gross ton delivered at consumers' mills and also about 1500 tons of compressed sheet steel scrap at about \$18 per gross ton delivered. Prices named below are largely nominal because of the small amount of scrap moving from dealers to consumers. We quote nominally as follows:

Heavy steel melting, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	\$20.00 to \$21.00
No. 1 cast, for steel plants (nominal)	25.00 to 26.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh (nominal)	25.00 to 26.00
Compressed steel	18.00 to 19.00
Bundled sheet, sides and ends, f.o.b. consumers' mills, Pittsburgh district (nominal)	16.00 to 17.00
Bundled sheet stamping (nominal)	15.00 to 16.00
Railroad grate bars (nominal)	17.00 to 18.00
Low phosphorus melting stock	24.00 to 25.00
Iron car axles (nominal)	42.00 to 43.00
Locomotive axles, steel (nominal)	45.00 to 46.00
Steel car axles (nominal)	42.00 to 43.00
Railroad malleable (nominal)	22.00 to 23.00
Machine shop turnings	12.00 to 13.00
Cast iron wheels	26.00 to 27.00
Rolled steel wheels (nominal)	22.00 to 23.00
Sheet bar crop ends (at origin) (nominal)	30.00 to 31.00
Heavy steel axle turnings (nominal)	14.50 to 15.00
Heavy breakable cast	25.00 to 26.00
Cast iron borings	16.00 to 17.00
No. 1 railroad wrought	28.00 to 29.00

St. Louis

St. Louis, Jan. 7

Pig Iron.—Buyers expected in the market this week held out, apparently waiting for the market to stabilize. No inquiries appeared, and efforts to induce customers to take canceled or unshipped tonnages to be billed at market prices at time of shipment failed. Few furnaces are quoting a reduction of \$3, while others are willing to accept reductions but are not making offers. Altogether, the market is awaiting developments, with the present expectation that buying will begin about Feb. 1.

Finished Material.—Mills are taking little business at the new prices. Warehouses have caught up with deliveries. For stock out of warehouse, soft steel bars are 4.04c.; iron bars, 4.04c.; structural material, 4.14c.; tank plates, 4.34c.; No. 8 sheets, 5.19c.; No. 10 blue annealed sheets, 5.24c.; No. 28 black sheets, cold rolled one pass, 6.29c.; No. 28 galvanized sheets, black sheet gage, 7.64c.

Old Material.—The scrap market is dull with no buying or selling, and prices are only estimates of value. Lists out include the Wabash Railroad, 1200 tons; Mobile & Ohio, 800 tons; Union Pacific, 750 tons; Baltimore & Ohio, 1000 tons; Big Four, 700 tons. We quote dealers' buying prices as follows, f.o.b. customers' works, St. Louis industrial district, per gross ton:

Per Gross Ton
Old iron rails
Old steel rails, rerolling
Old steel rails, less than 3 ft.
Relaying rails, standard sections, subject to inspection
Old carwheels
No. 1 railroad heavy melting steel
Heavy shoveling steel
Ordinary shoveling steel
Frogs, switches and guards, cut apart
Ordinary bundled sheet scrap
Heavy axle and tire turnings

Per Net Ton
Iron angle bars
Steel angle bars
Iron car axles
Steel car axles
Wrought arch bars and transoms
No. 1 railroad wrought
No. 2 railroad wrought
Railroad springs
Steel couplers and knuckles
Locomotive tires, 42 in. and over, smooth inside
No. 1 dealers' forge
Cast iron borings
No. 1 busheling
No. 1 boilers cut to sheets and rings
No. 1 cast
Stove plate and light cast
Railroad malleable
Agricultural malleable
Pipes and flues
Heavy railroad sheet and tank
Railroad grate bars
Machine shop turnings
Country mixed
Uncut railroad mixed
Horseshoes

The Consolidated Steel Corporation has opened general offices at 165 Broadway, New York. It is the sole representative for export of the products of Bethlehem Steel Co., Brier Hill Steel Co., Lackawanna Steel Co., Lukens Steel Co., Midvale Steel & Ordnance Co., Republic Iron & Steel Co., Sharon Steel Hoop Co., Trumbull Steel Co., Whitaker-Glessner Co. and the Youngstown Sheet & Tube Co. E. A. S. Clarke, formerly president Lackawanna Steel Co., is president, as stated last week, and H. H. Barbour, formerly Eastern district sales manager of the Lackawanna company, is vice-president. L. W. Hesselman, formerly controller of the Lackawanna company, is secretary and controller; A. Van Winkle, treasurer, and William Heyman, formerly of the Lackawanna Railroad, is traffic manager.

The Trumbull Steel Co. at Warren, Ohio, has commenced operation of its 21-in. bar mill, thereby completing installation of a complete steel department, including seven open hearth furnaces, 36-in. 2-high blooming mill and 18-in. bar mill.

Chicago

CHICAGO, Jan. 7—(By wire).

While the steel mills are revising contracts to accord with the new prices, except where material was bought for specific jobs, the producers of pig iron have come to no decision in that particular and are not a unit in the acceptance of the lower level. The matter of revising contracts is still under consideration by large interests. Southern furnaces and makers of special irons are indisposed to revise contracts, and to quote on the \$31 base. The compensation of war contractors is a puzzle and unless effected without too much delay, it will lead to disastrous consequences. A possible procedure where a former munitions contractor has under contract iron of a special grade which he cannot use in his regular business would be for the contractor to transfer his contract to the Ordnance Department if the seller of the iron refused to cancel or accept a cash consideration. Then, it is suggested, the War Department would not take a pound of the iron, and the iron producer would have no easy time in proving a loss, even though he would suffer one. Business is quiet. The export situation is mixed, there not being enough shipping space on the Atlantic or Pacific, while railroad permits are too sparingly granted to permit of a large tonnage being moved to the seaboard.

A local maker is quoting 2.80c. mill, for rail carbon or hard steel. The sheet mills see but little future business in sight, although the jobbers are buying well now. Bolts and nuts are being purchased in hand-to-mouth manner. Railroads are showing more interest in track fastenings, and indication that their stores are becoming depleted. Cast-iron pipe is lifeless and no business is expected until prices are modified. The scrap market continues to decline.

Ferroalloys.—In a market that shows no signs of activity, quotations are unchanged.

We quote 70 per cent ferromanganese nominal at \$225 delivered; 50 per cent ferrosilicon at \$155 to \$162.50, delivered, and 16 to 18 per cent spiegeleisen at \$65 furnace.

Plates.—The mills are in fair shape for the next few weeks and they are receiving a few orders from manufacturers and jobbers to fill current needs. It is conceded that a big tonnage would be booked, were the shipyards allowed to build steel ships for foreign account.

The mill quotation is 3c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 4.27c. for plates out of stock.

Pig Iron.—Variance of opinion as to prices is a marked feature of the situation, and the entire trade is still enveloped in uncertainty. It is yet to be determined to what extent the producers will revise contracts to accord with the new base of \$31, although it was expected some decision would be reached by Jan. 2, and it is known that some large makers were favorably disposed to readjust their contracts. Large Southern furnaces which are well sold ahead have given no hint of their attitude. Michigan charcoal iron makers say it is not their purpose to change their prices, either those specified in contracts or on new business. A maker of low phosphorus will take new business on the basis of the new price, but will not change contracts. Some makers of silvery are not disposed to change their prices, while at least one is saying nothing, but is piling iron and may be glad to accept the reduction. The trade would feel much easier if authoritative announcement were made as to manner in which compensation is to follow the cancellation of war contracts. Pointed to as a possibility is the transfer of contracts to the Ordnance Department under conditions where a producer of iron refuses to cancel, or accept a cash consideration in lieu of delivery, in which event the producer would have the War Department and not the contractor with which to deal. Here and there, a little business or prospective business is cropping out, with most of the inquirers specifying the new base. One inquiry calls for 1000 tons of malleable. Another is for five cars of foundry, and another for off-sulphur malleable. A carload of 6 per cent silvery was

sold to-day on the basis of the recent Government maximum. Considerable resale iron is being offered at the new base, although a commission is allowed for the selling.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5..	\$38.70 to \$39.00
Lake Superior charcoal, C to AA....	40.70 to 42.50
Lake Superior charcoal, No. 6.....	41.20 to 41.50
Northern coke foundry, No. 1 silicon, 2.25 to	
2.75	32.25
Northern coke foundry, No. 2 silicon, 1.75 to	
2.25	31.00
Northern high-phosphorus foundry	31.00
Southern coke, No. 1 foundry and No. 1 soft	
silicon, 2.75 to 3.25.....	39.00
Southern coke, No. 2 foundry, silicon, 2.25 to	
2.75	37.25
Southern foundry, silicon, 1.75 to 2.25.....	36.00
Malleable, not over 2.25 silicon.....	31.50
Basic	30.00
Low phosphorus (copper free).....	52.50
Silvery, 7 per cent.....	50.00

Sheets.—The demand from the jobbing trade for heavy gages is fairly good, but there is not much business in sight, and the mills will soon want business. Mill prices are 4.70c. for No. 28 black; 3.95c. for No. 10 blue annealed, and 6.05c. for No. 28 galvanized.

Chicago delivery out of stock regardless of quantity, No. 10 blue annealed, 5.17c.; No. 28 black, 6.22c., and No. 28 galvanized, 7.57c.

Rails and Track Supplies.—Inquiries from the railroads for track fastenings indicates that their stores are becoming depleted. Miscellaneous purchasing by the railroads is for prompter delivery than formerly.

Standard railroad spikes, 3.65c., Pittsburgh. Track bolts, with square nuts, 4.90c., Pittsburgh. Tie plates, steel, 3c., Pittsburgh and Chicago; tie plates, iron, 3.75c., f.o.b. maker's mill. The base for light rails is 3c., f.o.b. maker's mill, with usual extras.

Wire Products.—Although an Eastern maker asserts it wants no more nail business because it is filled with orders for that product, Western mills find business very slow. Inventories are not yet completed. For prices see finished iron and steel, f.o.b. Pittsburgh, page 153.

Bolts and Nuts.—Orders are being more freely placed, but all are small, indicating a hand-to-mouth policy. Reports from the East say the Navy is purchasing heavily. For prices see finished iron and steel, f.o.b. Pittsburgh, page 153.

Structural rivets, 5.67c.; boiler rivets, 5.77c.; machine bolts up to $\frac{1}{2}$ x 4 in., 40 per cent off; larger sizes 25 and 50 off; carriage bolts up to $\frac{1}{2}$ x 6 in., 35 off; larger sizes, 20 and 50 off; box pressed nuts, square tapped, 78c. off; hexagon tapped, 58c. off; coach or lag screws, gimlet points, square heads, 40 per cent off. Quantity extras for nuts are canceled.

Cast-Iron Pipe.—No business is reported, and none is expected, until a change in prices is announced.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., \$69.80; 6-in. and larger, \$66.80; class A and gas pipe, \$1 extra.

Structural Material.—Building work is slow in getting under way, and when it does it will be some time before the mills are affected. Contracts have been placed for 128 tons for a derrick for the Crowley Launch & Tug Boat Co., San Francisco, and 150 tons for a foundry to be erected by the Pacific Foundry Co. at San Francisco. The American Bridge Co. will fabricate 329 tons to be used in four turntables by the Chicago & Northwestern Railroad. A terminal station and office building at Oklahoma City for the St. Louis & San Francisco Railroad is coming up again, but will require only a small tonnage.

The mill quotation is 2.80c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 4.07c. for material out of warehouse.

Bars.—Despite some objection on the part of Eastern makers to 2.90c. Pittsburgh, as the quotation for common bar iron, it is safe to assert that price will stand for the present with Western mills. Rail carbon, or hard steel bars, are quoted at 2.80c. mill. Jobbers quote reinforcing bars at 3.97c. base. There is

but little new demand, but the call for steel for concrete work shows a little betterment.

Mill prices are: Mild steel bars, 2.70c., Pittsburgh, taking a freight rate of 27c. per 100 lb.; common bar iron, 2.90c., Pittsburgh; refined iron bars, 3.65 to 4.40c.; rail carbon, 2.80c., Pittsburgh.

Old Material.—The only business is that created by bargain hunters among consumers and occasional transactions by dealers who seek to cover old contracts. Further heavy declines are shown and everyone is beginning to wonder where the end will be. Several railroads offer lists but the aggregate tonnage is not large.

We quote for delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Iron rails	\$28.00 to \$29.00
Relaying rails	50.00 to 55.00
Carwheels	26.00 to 27.00
Steel rails, rerolling	23.00 to 24.00
Steel rails, less than 5 ft.	24.00 to 25.00
Heavy melting steel	18.00 to 19.00
Frogs, switches and guards, cut apart	18.00 to 19.00
Shoveling steel	18.00 to 19.00
Heavy steel axle turnings	16.00 to 17.00

Per Net Ton

Iron angles and splice bars	\$26.00 to \$27.00
Steel angle bars	20.00 to 21.00
Iron arch bars and transoms	29.50 to 30.00
Iron car axles	31.00 to 32.00
Steel car axles	29.00 to 30.00
No. 1 railroad wrought	21.50 to 22.50
No. 2 railroad wrought	20.00 to 21.00
Cut forge	20.00 to 21.00
Pipes and flues	16.00 to 17.00
No. 1 busheling	17.50 to 18.50
No. 2 busheling	12.00 to 13.00
Steel knuckles and couplers	23.50 to 24.00
Coil springs	24.00 to 25.00
No. 1 cast	24.00 to 25.00
Boiler punchings	24.00 to 25.00
Locomotive tires, smooth	26.00 to 27.00
Machine-shop turnings	9.50 to 10.00
Cast borings	10.50 to 11.50
Stove plate and light cast	17.00 to 17.50
Grate bars	16.00 to 16.50
Brake shoes	16.00 to 16.50
Railroad malleable	18.00 to 19.00
Agricultural malleable	18.00 to 19.00
Country mixed	12.00 to 13.00

Philadelphia

PHILADELPHIA, Jan. 7.

The question of adjustment of pig iron and steel contracts to the new price basis is uppermost in the minds of buyers and sellers. A Youngstown steel company has notified its trade that all contracts on its books for plates and sheets have been revised to the lower basis which became effective Jan. 1, this applying on specific business such as ship and car plates as well as on material for resale. No such action has been taken, however, on semi-finished steel. Several of the larger steel companies, including two Pittsburgh producers and another Youngstown interest, are revising prices on jobbers' and fabricators' contracts, but announce that they will not do so on specific orders. Eastern Pennsylvania steel companies either have taken similar action or will probably do so soon. Steel companies make a distinction between jobbers' orders and specific business for the reason that jobbers would face a heavy loss if they were obliged to take out material for resale at the higher prices which prevailed up to the end of last year, while consumers who placed specific orders for ships, locomotives, cars or similar work protected themselves by figuring prices for their finished products on the basis of the steel prices which were in effect when the orders were placed. The French Government has asked steel manufacturers to revise prices on orders which were placed before the armistice was signed. One company which declined to revise received a cancellation. In another case, an attempt to cancel resulted in so strong an objection from the steel company that the order was left undisturbed.

In the pig iron trade, sellers are generally resisting attempts to cancel, but there have been many controversies and in some instances sellers are at a loss as to what action to take. The attitude of a number of consumers is that inasmuch as their Government

work has been canceled they should have the privilege of cancelling all material bought for that work. Pig iron sellers do not agree with this attitude, and though in nearly all cases they have insisted on contracts being carried out, they have lessened consumers' burdens by spreading out deliveries over longer periods. Many different claims for revision of pig iron contracts are being proposed by consumers, and it seems likely that each case will be considered on its merits and with respect to the way in which the contract reads. There have been sales of basic iron in the past week at \$33.90, delivered Philadelphia, but the lots bought were for immediate delivery. No new contract business is being done, consumers being pretty well covered.

The lack of new business is reflected in curtailment of operations at steel plants. One Eastern Pennsylvania company is operating its open-hearth furnaces at only 50 per cent.

Export business is coming along slowly but the reduction in ocean freight rates by the United States Shipping Board is expected to bring more activity. An order for 23,000 tons of hull plates, on which credit had expired Dec. 31, has been reinstated with a Pennsylvania mill by Japanese interests.

The scrap market shows further weakness. Mills have offered \$18 for heavy melting steel. Borings and turnings for blast furnaces have sold at \$12, delivered, while dealers have been offering only \$10.

Ferroalloys.—The alloys market is flat, there being no buying interest. Producers are quoting \$225, delivered, for 70 per cent ferromanganese and would consider business in spiegeleisen at \$60, f.o.b. furnace. When buying is resumed, it is possible that it will be at prices lower than these figures, as there is considerable resale material in the market which cannot be disposed of under present conditions at any price.

Pig Iron.—Three pig iron merchants have sold 1000 tons each of basic pig iron within the past few days at \$33.90, delivered Philadelphia. This iron was all for immediate delivery. No contract business is being done and sellers expect a period of hand-to-mouth buying. There is very little activity in other grades of iron. A small sale of standard low phosphorous iron was made on the basis of \$51 at furnace for the grade 0.04 per cent phosphorus, but the buyer paid the freight of \$3.70 per ton from furnace. For the present, makers of low phosphorus iron will continue to sell on an f.o.b. furnace basis. A lot of misfit basic iron was sold to an Eastern steel company at 50 cents a ton below the basic iron price. In the absence of inquiries, Virginia iron producers are withholding announcement of what prices they will quote for delivery in the Philadelphia district, but it is admitted that when they need business they will be obliged to abandon the Birmingham basing and quote delivered prices that will meet those quoted by Eastern Pennsylvania furnaces, which are on the basis of \$34.90, delivered Philadelphia, for No. 2 foundry iron. Eastern furnaces are still clinging to the Pittsburgh basing, but consumers who have iron under contract will, it is expected, insist on iron being shipped to them on an f.o.b. furnace basis. Eastern steel plants maintain that they will be badly handicapped in meeting the competition of Pittsburgh and Youngstown mills if they are obliged to pay the Pittsburgh freight. Where contracts specifically state that the price, after withdrawal of Government price fixing, is to be "the last-named Government price" sellers will probably insist that they are entitled to the Pittsburgh basing. There have been quite a number of attempts to cancel, consumers taking the attitude that as their Government contracts have been canceled they have a right to expect the privilege of cancelling all material bought for those contracts. Sellers do not agree with this attitude and there is a prospect of some litigation if controversies are not amicably adjusted. Early in the fall, considerable iron was sold for first quarter and first half, with deliveries to begin Jan. 1, and it was specified that should Government prices be withdrawn during the life of the contract, the last-named Government price would apply. Some consumers maintain that the phrase "life of the contract," means from the date deliveries were to begin, namely Jan. 1,

and that as Government prices were withdrawn before that date, they are entitled to the current prices now quoted. Sellers take the stand, however, that "life of the contract" means from the date the contract was signed and that therefore the last-named Government price should apply. We quote for delivery in the Philadelphia district on all grades except standard low phosphorus as follows:

Eastern Pennsylvania No. 2 X (2.25 to 2.75 sli.)	\$36.15
Eastern Pennsylvania No. 2 foundry (1.75 to 2.25 sli.)	34.90
Virginia No. 2 X (2.25 to 2.75 sli.)	38.75
Virginia No. 2 foundry (1.75 to 2.25 sli.)	37.50
Basic	33.90
Gray forge	33.90
Standard low phosphorus, f.o.b. furnace	51.00
Copper-bearing low phosphorus	48.90

Plates and Shapes.—Eastern mills still adhere to the 3.25c. price on plates and the 3c. price on shapes, but no business is being done except in a very small way. A Delaware plate mill, which received very heavy cancellations of ship steel, is now running on plates for a locomotive works, the business having been taken at 3c., base, Pittsburgh. The French Government has attempted to obtain price revision on contracts for structural shapes, and in one instance where revision was not granted by the mill a cancellation order followed. In the case of another attempt to cancel, the mill objected and the French Commission agreed to accept the material at the contract price. Jobbers and fabricators' contracts are being revised to the new price basis, but where material was bought for specific work there has been no revision except in the case of one Youngstown company, which granted the new price on plates on every order on its books, including orders placed by the Emergency Fleet Corporation. The new contract form of the American Iron and Steel Institute is being considered by Pennsylvania steel companies, but a number of them probably will not adopt it. They fear that under such a contract they could not induce fabricators to place much material in stock, and the fabricators' warehouses have always been a convenient outlet for surplus rollings. With such a contract in force, fabricators would probably specify only as they needed material and the steel companies would be obliged to carry large tonnages in their own warehouses. We quote plates at 3.245c. and shapes at 3.045c., Philadelphia.

Sheets.—A Youngstown producer of sheets has revised all contracts on its books to the new prices which became effective Jan. 1. Some other makers are revising prices only on sheets which were bought for resale, such as jobbers' requirements. We quote No. 10 blue annealed sheets at 3.145c., No. 28 black sheets, 4.945c. and No. 28 galvanized at 6.295c., all delivered Philadelphia.

Ore.—There is no activity in foreign manganese ore. A seller endeavored last week to interest consumers and named a price of \$1 per unit, this being 10c. below the price at which the last contract was made. Since that time, however, ore has been offered for resale at about 80c.

Iron and Steel Bars.—Bar iron rolling mills in the Philadelphia district have not taken any action on prices, and their quotations remain at 3.50c. for common iron, 4.25c. for iron bars made from selected scrap and 5c. for refined iron. It is probable that reductions will be made to conform to the price made by Western producers of 2.90c., Pittsburgh, for common iron, but no action will be taken prior to the meeting of the Eastern Bar Iron Institute on Jan. 15. Some jobbers are requesting substitution of steel bars for bar iron from companies which make both. We quote soft steel bars at 2.945c., Philadelphia.

Semi-Finished Material.—The Navy Department has placed an order for 450 tons of forging billets at \$60, this being the price which prevailed in December, when the bids were put in. The present price is \$56, Pittsburgh. There is no demand for re-rolling billets or slabs. A plate rolling mill asserts that it cannot buy slabs at \$46, Pittsburgh, the new price, and sell plates at 3c. We quote rerolling billets, delivered Philadelphia, at \$47.30.

Old Material.—Steel plants are now offering \$18 per gross ton, delivered, for No. 1 heavy melting steel and any business done this week will probably be on that basis. The last sale reported was at \$19. There has been a good demand for blast furnace borings and turnings and one dealer has sold several thousand tons at \$12, delivered, but further business will probably be negotiated at not more than \$11. This dealer is offering only \$10 to producers of this grade of scrap. There is little or no activity in other grades of scrap. We quote for delivery at works in the Philadelphia district as follows:

No. 1 heavy melting steel	\$18.00 to \$20.00
Steel rails, rolling	26.00 to 28.00
No. 1 low phosphorus, heavy, 0.04 and under	26.00 to 27.00
Iron rails	30.00 to 35.00
Carwheels	25.00 to 26.00
No. 1 railroad wrought	25.00 to 26.00
No. 1 yard wrought	22.00 to 23.00
Country yard wrought	14.00 to 15.00
No. 1 forge fire	19.00 to 21.00
Bundled skeleton	19.00 to 21.00
No. 1 busheling	20.00 to 21.00
No. 2 busheling	16.00 to 17.00
Turnings (for blast furnace uses)	11.00 to 12.00
Machine-shop turnings (for rolling mill use)	15.00 to 16.00
Cast borings (for blast furnace use)	11.00 to 12.00
Cast borings (clean)	17.00 to 18.00
No. 1 cast	24.00 to 25.00
Grate bars	18.00 to 20.00
Stove plate	19.00 to 21.00
Railroad malleable	18.00 to 20.00
Wrought iron and soft steel pipes and tubes (new specifications)	18.00 to 20.00
Ungraded pipe	17.00 to 18.00

Buffalo

BUFFALO, Jan. 6

Pig Iron.—The market for the week has not exhibited much activity, although some inquiry is being made and producers think business is likely to pick up very shortly. First quarter capacity appears to be entirely taken and most of the second quarter, but some furnaces still have tonnage for second quarter that can be secured by old customers. Others are nearly sold up for second and expect that capacity productions for that period will soon be fully taken. There is still some division of ideas on the matter of prices to apply on old contracts, but where specific contracts are in force at former Government schedule, sellers consider they are binding for delivery at those prices. Where iron was sold with the stipulation that Government prices at the time of shipment was to apply, the open market price is to be accepted on shipments after Jan. 1. New business is taken at the open market price of \$3 per ton under the Government schedule which was in force up to Jan. 1. On Lake Superior charcoal iron, no change has as yet been made from the former Government price. We quote as follows on new business, f.o.b. furnace, Buffalo:

No. 1 foundry, 2.75 to 3.25 silicon	\$34.00
No. 2 X, 2.25 to 2.75 silicon	32.00
No. 3 foundry, 1.75 to 2.25 silicon	31.00
Gray forge	30.00
Malleable silicon not over 2.25	31.50
Basic	30.00
Bessemer	32.20
Lake Superior charcoal, regular grades, f.o.b. Buffalo	38.50

Finished Iron and Steel.—Current buying is largely on the hand-to-mouth basis, although a good volume of inquiry is before the market. Inventories are pretty well out of the way and the general report is that conditions of stocks are spotty and not well balanced, with excess supply in some sizes and low stocks in many other sizes. The present policy of jobbers seems to be one of caution as regards re-stocking, except to even up on inequalities in sizes, and of users in general to buy conservatively and only such material as they need to balance up stocks or to meet special requirements. It is stated that mills are scheduled in full for months ahead on plates and structural material and on certain sizes of bars, while on the smaller bars and rounds they are in position to accept orders for almost immediate shipment. The restrictions are entirely re-

moved on shipments into Canada with the exception of shipments of tin plate, upon which product a license is still required. The discounts on pipe and the revised card on cold rolled shafting and screw stock that went into effect Jan. 1 have stimulated buying, some jobbers report. It is understood that the proposed new contract form has not been generally adopted, but that its adoption is still under consideration.

Old Material.—No signs of a buying movement have appeared as yet, and the market is devoid of any indications of coming activity or special features. Consumers are evidently as much at a loss with respect to discerning the probabilities as to future demand as are the dealers and the supposition is that there will be no tendency towards buying during January. Inquiry and sales are at a very low ebb and prices are absolutely nominal. Dealers expect that the market will continue in its present state for another month at least, and that consequently prices will undoubtedly soften further, owing to the absence of buying. Almost every commodity on the list has taken a drop of \$2 per ton with the exception of car wheels and grate bars, heavy melting steel having fallen to \$19 to \$20. We quote as follows per gross ton, f.o.b. Buffalo:

Heavy melting steel, regular grades	\$19.00 to \$20.00
Low phosphorus, 0.04 and under	27.00 to 28.00
No. 1 railroad wrought	26.00 to 27.00
No. 1 machinery cast scrap	26.00 to 27.00
Iron axles	32.00
Steel axles	32.00
Car wheels	27.00 to 28.00
Railroad malleable	26.00 to 27.00
Machine shop turnings	12.00 to 13.00
Heavy axle turnings	18.00 to 19.00
Clean cast borings	15.00 to 16.00
Iron rails	27.00 to 28.00
Locomotive grate bars	23.00 to 24.00
Stove plate	23.00 to 24.00
Wrought pipe	17.00 to 18.00
No. 1 busheling scrap	17.00 to 18.00
Bundled sheet stamping scrap	17.00 to 18.00

Birmingham

Pig Iron.—Alabama independent iron producers, at least the four largest, are firm in quoting \$34 and no other price has been named by them in any recent transactions that have come to the surface. The leading foundry producer made a number of sales of small lots during the week at this price and another interest sold lots of 50 and 100 tons at that figure. All the business going was on this basis. It was not much in volume, but uniformity in transaction denotes the market. Not only are the producers concerned in the \$34 level on account of business that is being booked and a general regard for the future, but it is believed they have an eye also on the stability of the contracts for first quarter and first half made when \$34 was the Government price. Stability in current business carries greater willingness on the part of consumer to accept the Government price on business booked under its regime. One concern received a number of offers on the basis of \$31, but it is averred that none of them was accepted. Considerable tonnage could be booked at that figure, but furnaces are so well taken care of for three to six months that they can afford to wait. Not before buying for the second half sets in will there be a real showdown. The leading interest, of course, announces the Gary schedule, but at last accounts had not entered the market and was not offering tonnage. The Talladega furnace is being repaired. Five thousand tons for Japan left Pensacola during the week. It was furnished by a number of interests. We quote per gross ton f.o.b. Birmingham district furnaces for prompt delivery as follows:

No. 2 foundry and soft	\$34.00
Basic	33.00

Cast-Iron Pipe.—The cast-iron pipe trade is still listless, with practically no soundings for future business. Production is at a low ebb and many sanitary shops will remain down for some time. Louisiana and Texas oil and gas companies are expected to enter at an early date.

Coal and Coke.—The coal output took a slump during Christmas week, as was expected, the output being only 109,000 tons compared with 368,000 during the preceding week.

Old Material.—The scrap market has been hampered into an almost prostrate state and efforts of sellers to stiffen prices by holding back on sales have been nugatory. They are reported as willing to sell at present low levels, although there has not been much business. It is essentially a buyer's market. Dealers are forced to sell at the low price in instances on account of necessity to meet banking obligations. We quote per gross ton f.o.b. Birmingham district yards as follows:

Old steel axles	\$30.00 to \$31.00
Old steel rails	19.00 to 19.50
Heavy melting steel	18.00 to 18.50
No. 1 railroad wrought	20.00 to 21.00
No. 1 cast	21.00 to 22.00
Old carwheels	20.00 to 21.00
Tram carwheels	19.50 to 20.00
Machine-shop turnings	8.50 to 9.00
Cast-iron borings	8.50 to 9.00
Stove plate	14.00 to 15.00

British Steel Market

Export Pig Iron Licenses Hard to Obtain—Some Price Changes (By Cable)

LONDON, England, Jan. 8.

Blast furnaces are working indifferently and export licenses for pig iron are difficult to obtain. A few small rail orders are appearing, but general export business has been made stagnant by subsidies. It is officially announced now that dealers and consumers are allowed to replenish their stocks out of subsidized material. For pig iron and steel domestic prices are now maximum and not fixed prices. Export prices on small angles, tees, flats and small rounds, squares and hexagons are now reduced to £18 10s. Export prices for sheet bars and tin plate bars are now fixed at £12 17s. 6d. Domestic price on bar iron has been advanced to £15 10s. and marked bars to £18. Following are the revised official domestic maximum prices for steel applicable after Feb. 1, 1919, per gross ton, net f.o.b. makers' works:

Ship, bridge and tank plates, £14 [£11 10s.]*
Boiler plates, £15 [£12 10s.]
Ship, bridge and tank plates, thin, £16 [£14 10s. to £17 10s.]
Angles and bulb angles, £13 12s. 6d. [£11 2s. 6d.]
Small angles, tees and flats, £16 10s. [£14 to £16]
Beams, £13 12s. 6d. [£11 2s. 6d.]
Rails, 60 lb. per yd. and upward, £13 7s. 6d. [£10 17s. 6d.]
Rounds, squares and hexagons, £14 5s. [£12 10s. to £13]
Small rounds, squares and hexagons, £16 10s. [£15 to £15 10s.]
Blooms, billets and slabs for rolling, £11 12s. 6d. [£10 7s. 6d.]
Blooms, billets and slabs for forging, £12 15s. [£11]
Ingots for rerolling, £9 5s.

*Prices in brackets are the official control prices for domestic business effective till Feb. 1.

Peace Trade Developing Rapidly—New Steel Prices—Ore Import and Other Statistics

(By Mail)

LONDON, England, Dec. 10.—General business conditions in this country are gradually beginning to assume an aspect of something approaching old time conditions, when trade was untrammelled, and the whole plant and energy of the country did not need to be devoted to the creation of war material. Iron and steel is no exception, and the various regulations and special conditions under which the industry has been working in the past few years are beginning to disappear. One of the first signs of the new state of affairs was the decision announced with regard to the subsidies, which are to be gradually withdrawn, those on steel being brought to an end on Jan. 31, 1919, and on pig iron on April 30, when subsidies will cease altogether. Meanwhile, trade on peace lines is beginning to develop fairly rapidly, an important feature being the demand for rails as well as for all kinds of constructional and shipyard material. These departments are very active and the trade looks like expanding.

The present maximum home prices stand as they

are at present until Jan. 31. A new schedule will then come into force, such a step being obviously necessary by reason of the withdrawal of the subsidies. As regards the new export prices, it has to be noted that these include the full amount of the subsidies, and the Government will levy a drawback representing the difference between the home "free on board" price, plus actual cost of putting f.o.b. and the export price.

As regards pig iron, a good deal of uncertainty has been felt in the Cleveland iron market, but this has been removed to a large extent by the announcement that the Government will continue the subsidies until April 30 on pig iron. Consumers now know better where they stand, and a good inquiry has been stimulated both by the abolition of the allocation system and the prospects of rising prices. As regards the export trade, the new schedule of price issued by the Government reveals important advances in rates, but this was largely expected. Neutral countries have, however, suffered from very short supplies, and a good demand is certain to develop as soon as export licenses are obtainable. As regards hematite iron, the official control continues for the present. The home maximum price stands at 122s. 6d. for East Coast mixed numbers, and the export price is 177s. 6d.

With reference to the foreign ore trade, there appears to be ample stocks. The return to normal conditions in this trade depends so largely on the shipping situation that it will not likely be seen in the immediate future. Consumers are inclined to buy ahead, but sellers are cautious about committing themselves.

An interesting item among the various signs of the return of peace has been the publication by the Board of Trade of their import and export returns in their old form. During the war, it was found undesirable to publish the actual details, as to countries of origin of imports and the destination of exports, but they have now reverted to their previous practice. It is interesting to observe that during the 11 months to Nov. 30, 1918, the iron ore imports were 6,099,994 tons, which is an increase compared to the same period last year.

It is reported that another amalgamation of interests in the steel trade has been effected recently on Teeside, the announcement being that the Seaton Carew Iron & Steel Co. has become associated with the Furness group. The new arrangement takes effect on Jan. 1. This is the second important step taken this year by Lord Furness, the iron works and foundries of Cochrane & Co., Middlesbrough, having already been acquired.

Early in December, revised export prices for pig iron were issued, also revised home prices for steel, and an export price schedule for steel. Present home and export prices are as follows per gross ton:

	Pig Iron			Home			Export		
	prices, net cash f.o.t.	Home		prices, net cash f.o.b.	Export		f	s	d
		f	s		f	s			
East Coast mixed Nos. 1, 2 and 3	6 2 6			8 12 6					
Scottish, Nos. 1, 2 and 3	6 2 6			8 12 6					
Welsh, Nos. 1, 2 and 3	6 2 6			8 12 6					
West Coast, Nos. 1, 2 and 3	6 7 6			8 17 6					
Refined cupola cast	8 0 0			10 10 0					
Cast direct from blast furnaces, large pig, all grades	6 17 6			9 7 6					
Cleveland No. 3 foundry	4 15 0			7 5 0					
Cleveland forge	4 15 0			7 5 0					
Derbyshire, Leicestershire and Notting- ham No. 3 foundry	4 12 6			7 2 6					
Derbyshire No. 4 forge	4 10 0			7 0 0					
Lincolnshire foundry	4 17 6			7 7 6					
Lincolnshire forge				7 7 6					
Northamptonshire No. 3 foundry	4 10 0			7 0 0					
Northamptonshire No. 4 forge	4 7 6			6 17 6					
North Staffordshire foundry	4 17 6			7 7 6					
North Staffordshire No. 4 forge	4 15 0			7 5 0					
South Staffordshire, Shropshire & Worcestershire part mine foundry	5 2 6			7 12 6					
South Staffordshire part mine forge	5 0 0			7 10 0					
Scottish No. 3 foundry	5 14 0			8 4 0					
Cleveland	5 0 0			7 10 0					
Derbyshire, Leicestershire and Notting- ham	4 17 6			7 7 6					
Lincolnshire	4 17 6			7 7 6					
Northamptonshire	4 17 6			7 7 6					
North Staffordshire	4 17 6			7 7 6					
South Staffordshire, Shropshire & Worcestershire	4 17 6			7 7 6					

	Finished Iron and Steel			Home trade, net, f.o.t.	Export, net, f.o.b.
	f	s	d		
Ship, bridge and tank plates	14	0	0	16 10 0	0
Ship, bridge and tank plates, thin	16	0	0	19 10 0	0
Boiler plates	15	0	0	17 10 0	0
Chequer plates	15	10	0	18 0 0	0
Angles and sections	13	12	6	16 2 6	6
Small angles, tees and flats	16	10	0	20 0 0	0
Joists (beams)	13	12	6	16 2 6	6
Rounds, squares and hexagons	14	5	0	17 10 0	0
Small rounds, squares and hexagons	16	10	0	20 0 0	0
Rails, 60 lb. and over	13	7	6	15 10 0	0
Billets, ordinary rolling quality	11	12	6	13 10 0	0
Billets, forging and hard	12	15	0	15 0 0	0
Ingots, rerolling	9	5	0		
Bar iron	14	15	0	20 0 0	0

San Francisco

SAN FRANCISCO, Dec. 31.

With the removal of price restrictions effective next month, the metal trade has assumed a waiting attitude. The announcement of reduced prices of steel materials is expected here to be followed all along the line, and as a consequence there is a tendency to go slow until the market has adjusted itself to the new conditions of peace and unrestricted trade. In building and some other circles it is felt here that there is likely to be further reduction in the prices of structural material after the first quarter, and this impression will hold up immediate resumption of new construction work. It is expected that canceled orders will throw a considerable quantity of various materials on the market here for resale, and this has had a tendency to further disturb the market. Added to these factors, the fact that the present is the natural dull season of the trade, the time when jobbers are taking stock and letting their reserves fall to as low standard as practicable, the local market for both iron and steel is almost dead, but there will be a partial revival immediately after Jan. 1. Jobbers' stocks are at the lowest levels, and some work must go on, regardless of price. It is likely that during the first quarter of 1919 the jobbers will renew their stocks very cautiously.

Bars.—The local mills have not announced a change in the price of bars, and until the scrap market becomes easier with a better supply in sight, it is not likely that material reduction will be made.

Structural Steel.—A good deal of building is planned in the near future, and since the signing of the armistice architects have resurrected a number of projects which have lain dormant for over a year.

Plates.—The jobbers will have to be in the market for renewed stocks shortly after the first of the year, but they will doubtless buy cautiously on the start.

Sheets.—Sheets are in the same condition as plates, save for the fact that the jobbers' stocks of the former were more depleted than in the case of the latter. The jobbers expect to buy more freely of sheets, therefore, as soon as the current year's business is closed.

Wrought Pipe.—No new price for tubular goods in this market has yet been announced for the new year, but the statement is made that a cut of \$6 will probably be made by jobbers to conform with the reductions made at the mills.

Cast Iron Pipe.—No notice of reduction in prices has been received here and no forecast of a reduction is forthcoming here. The market is dead, owing to general uncertainties and to natural conditions at this season of the year.

Pig Iron.—The open market on prices has as yet had no effect on local pig iron. It is expected that it will be easier in the near future, but as yet there is apparently no iron to be had here except on old contracts.

Coke.—The local coke situation is showing improvement, and it is expected that coke will be easy in the near future. The supply is sufficient for local needs.

Scrap.—The scrap situation is somewhat complicated. The mills have practically stopped buying and they are looking for a decline in price. At the same time, it is undeniable that scrap is scarce, and the opening of the foreign market, although licenses are hard to get, has a tendency to keep up the price. Notwithstanding the attitude of the mills, which are the principal consumers of scrap, some dealers are predict-

ing an increase in price with Government restrictions removed. With practically no purchases the market is for the moment at a standstill.

Cleveland

CLEVELAND, Jan. 7.

Iron Ore.—Most of the ore mining companies will hold their annual meetings this month during which the general situation, including such subjects as mining costs and ore prices, will probably be discussed. Until the pig iron and steel market becomes more settled, it is not expected that consumers will show much interest in buying ore for the coming season. We quote delivered lower Lake ports as follows:

Old range Bessemer, \$6.65; old range non-Bessemer, \$5.90; Mesaba Bessemer, \$6.40; Mesaba non-Bessemer, \$5.75.

Pig Iron.—One of the leading interests in this territory is reducing pig iron prices to the new basis on undelivered tonnages on 1918 contracts and on contracts taken for the first half of this year at the last Government price. Two large producers so far have not decided whether they will make this revision and others have declined to make it. The market continues dull. A few inquiries for Bessemer, basic and foundry iron are reported, in lots of from 500 to 1000 tons for the steel-making grades, all for early shipment. There is practically no demand for contracts. Consumers have adopted a waiting policy and some foundries have advised sellers that while they expect to need additional iron for their first-half requirements, they will postpone placing orders except for small quantities as needed. Some consumers are taking all their iron on contracts, but requests to hold up shipment are being received every day and there are a large number of new requests for cancellation of old contracts for iron that furnaces were unable to deliver because of the Government allocations that had to be given preference. Southern producers with two exceptions are apparently still holding to the old Government maximum price. Producers of Ohio silvery iron have not reduced their prices to the new basis and the sale of a small lot is reported at the price that prevailed under Government regulation. We quote delivered Cleveland, as follows:

Bessemer	\$33.60
Basic	30.40
Northern No. 2 foundry	31.40
Southern No. 2 foundry, silicon, 2.25 to 2.75	37.25
Gray forge	30.40
Ohio silvery, 8 per cent silicon	49.90
Standard low phosphorus, Valley furnace	51.00

Coke.—There is no activity in the coke market. Foundries generally are covered with contracts for their first-half requirements and the supply of foundry coke is ample. In fact, shipments are being made faster than needed.

Bolts, Nuts and Rivets.—The bolt and nut market is firm but quiet. A few inquiries are coming out for small lots for early shipment. The rivet market is firm and some makers are covering their trade with contracts for the first-half at present prices. The demand from the shipyards continues heavy. There is little inquiry from the railroads.

Finished Iron and Steel.—The demand is dull in all finished steel lines although a slight improvement is noted over the previous two or three weeks. Several mills are revising to the present prices. Old contracts for material not purchased for specific work and sheet contracts taken late last year at the prices then prevailing for delivery after Jan. 1 are being revised to the new basis. Some demand is springing up from the railroads. Ohio structural shops have taken bridge work for the Louisville & Nashville Railroad aggregating about 800 tons and the New York Central lines are inquiring for track bolts. It is expected that for some time the buying will be in specified lots rather than in placing contracts for the requirements over a stated period. Consumers are buying only for their early needs in steel bars. One inquiry has come from an automobile part manufacturer for 1500 tons. There is little inquiry for plates and unless there is an improvement shortly, some mills will be practically out of

orders. Prices are firm and some companies say they will shut down their plate mills rather than try to book tonnages by cutting prices. Sheet sales are light, but inquiry has improved somewhat. Many consumers have stocks that were accumulated for Government work. The price list of extras on cold-finished steel and shafting has been revised under date of Jan. 1. The principal changes include the waiving of the extra for cutting rounds under $\frac{1}{4}$ in. to accurate length. The extra for boxing and burlapping is advanced and there is a new extra for accuracy for steel 31 per cent and over in carbon. Resale tool steel is being placed on the market by munition makers at \$1.50 but mills generally are adhering to the \$2 price.

Cleveland bar iron mills so far have not adopted regular prices on iron bars. They have not yet met the Chicago price of 2.90c. Pittsburgh, but have cut the former price \$4 a ton to 3.30c. However, this price can doubtless be shaded, although the mills claim they cannot meet the steel price. Cleveland jobbers have made a reduction in warehouse prices corresponding to the reduction in mill prices, thus retaining the differential established under Government regulation of \$1 per 100 lb. on mill products, except black and galvanized sheets, on which the differential remains at \$1.25. New jobbers' prices are:

Steel bars, 3.87c.; plates, 4.17c.; structural material, 3.97c.; No. 10 blue annealed sheets, 5.07c.; No. 28 black sheets, 6.12c.; No. 28 galvanized sheets, 7.47c.

Old Material.—A few mills have been quietly buying small lots of heavy melting steel, borings and turnings during the week, and it is believed that there will be transactions within the next few days that will to some extent clear up the price situation. At present the market is badly demoralized and bargain counter prices are not arousing any interest among the trade generally. Embargoes that have been in effect against delivery of scrap to all Cleveland mills have not been lifted and these have contributed to the weakness of the local market. Dealers were able to clean up most of their contracts in December except material that was embargoed and consequently there have been few cancellations during the past week. Turnings are particularly weak and are being sold all the way from \$7 to \$10 per gross ton in this market. A Pittsburgh district mill has purchased several thousand tons at from \$12 to \$14, delivered, but is no longer in the market. Borings in Cleveland are quoted as low as \$12. A limited demand is reported in a Pittsburgh district for this grade at \$16.50 delivered. Dealers state that mills can probably pick up some heavy melting steel at \$20 in small lots. This grade from Canada is being offered here at \$24 delivered. A Cleveland mill has declined a round tonnage of busheling offered at \$20. Railroad wrought scrap has sold at \$25. We quote delivered consumers' yards in Cleveland and vicinity as follows:

Steel rails	\$20.00 to \$22.00
Steel rails, under 3 ft	26.00 to 27.00
Steel rails, rerolling	25.00 to 27.00
Iron rails, nominal	28.00
Iron car axles, nominal	37.00 to 38.00
Steel car axles, nominal	37.00 to 38.00
Heavy melting steel	20.00 to 22.00
Cast borings, nominal	12.00 to 13.00
Iron and steel turnings and drillings	8.00 to 9.00
Compressed steel scrap	24.50 to 25.00
No. 1 railroad wrought	24.00 to 25.00
Cast iron car wheels	25.00 to 26.00
Agricultural malleable	21.00 to 22.00
Railroad malleable	25.00 to 26.00
Steel axle turnings	19.00 to 22.00
Light bundled sheet scrap	12.50 to 13.50
No. 1 cast, nominal	27.00 to 28.00
No. 1 busheling, nominal	19.00 to 20.00
Railroad grate bars	16.00 to 17.00
Stove plate	16.00 to 17.00

Buys West End Furnace

The Allen S. Davison Co., Pittsburgh, has purchased the West End furnace, Roanoke, Va. The stack, 82 x 16 ft., was built in 1890 and blown in Dec. 1, 1890. It has an annual capacity of 48,000 tons. A receiver was appointed in February, 1912, and the property has passed through several ownerships since that time, having last been acquired by John B. Guernsey & Co., Roanoke.

New York

NEW YORK, Jan. 7.

Pig Iron.—Reductions in freight rates to South America, Japan and other countries of from 25 to 30 per cent have not stimulated exports but have had a tendency to check the movement to other countries, as it is evidently hoped by buyers in foreign countries that freights will still further decline. The domestic demand continues lifeless and many foundries in the metropolitan and nearby districts find themselves with very limited business and they are not very confident as to orders developing at an early date. Hence they are not doing any buying and in some cases are urging a revision of contracts. One important buyer who melts about 20,000 tons per year first requested that his contract be canceled and then that the tonnage be reduced and the final settlement was on the basis of extending deliveries. This seems to be the general policy, as furnaces are strongly opposed to canceling. It seems very probable that the basing system inaugurated Oct. 1 will be discontinued as soon as active buying develops, for it is evident that that system can not survive under competitive conditions. Up to the present time, however, no greater reductions than \$3 per ton have been announced. We quote prices as follows for tidewater delivery for Northern and Southern grades as follows:

No. 1 foundry, silicon, 2.75 to 3.25.....	\$38.30
No. 2 X, silicon, 2.25 to 2.75.....	36.55
No. 2 plain, silicon, 1.75 to 2.25.....	35.30
No. 2 X, Virginia, silicon, 2.25 to 2.75.....	39.95
No. 1 Southern (all rail).....	39.95
No. 2 Southern (all rail).....	38.70

Ferroalloys.—The market for manganese alloys is entirely stagnant, there being almost no inquiry nor any means of judging values. Producers, if asked to quote, state that they will offer 70 per cent ferromanganese at \$225, or \$3 per unit above this standard. Various lots of resale ferromanganese have been offered, but the consumers who make the offer do not appear to set any value upon the material nor can prospective sellers obtain any offerings from other consumers. A few carloads of spiegeleisen have been sold in the last week for early delivery at from \$65 to \$70, furnace, for alloy of any analysis, but demand in general is extremely light. It is a question as to what a large inquiry for this material would actually bring, some placing it as low as \$60, furnace. Ferrochrome is quoted at 36c. per lb. of contained chromium for the grade containing 4 to 6 per cent carbon, with 34c. per lb. asked for that having 6 to 8 per cent. carbon, and 32c. per lb. for that having 8 to 10 per cent carbon. Ferrotungsten is not quoted. Ferro-carbon-titanium, 15 to 18 per cent, is selling at \$200 per net ton in carload lots, at \$220 per ton in lots between one ton and a carload, and at \$250 per ton in lots less than a ton, f.o.b. Suspension Bridge, N. Y.

Finished Iron and Steel.—Domestic and export business in steel products is marking time, though a fair number of small orders is being received, mostly for prompt shipment. Factors militating against rapid expansion of steel export trade are the scarcity of bottoms and high ocean freight rates. The United States Shipping Board has begun the gradual releasing of ships for commercial trade, but it is believed that it will be at least the middle of the year before a sufficient tonnage has been released to take care of a normal export trade. Although the Shipping Board is in control of freight rates on American ships, British ships are charging high rates, making it necessary for American exporters to quote on a delivered basis to get business abroad in competition with England. For example, the rate from England to Rio de Janeiro on steel products is \$15 a ton, while from New York to Rio de Janeiro the rate, as charged by British ships, is \$25 a ton or higher. To the Far East the rates are even more in favor of British shippers. An inquiry from China for 2500 tons of ship plates, which came to this market a few weeks ago, resulted in a bid of about 3.50c., New York, and British steel companies are reported to have made about the same price. The business went to England, however, because the freight rate from American mills to Shanghai was about \$60 a

ton higher than the rate from England. Exporters believe that business will develop slowly as long as prices remain at their present high level, but they see signs of quotations being made soon for export trade on a lower basis than for domestic business. An exporter reports being able to place orders for plates at a shade under 3c. One steel company, which is a member company of the Consolidated Steel Corporation, has about 200 export inquiries on file on which no action has as yet been taken. The structural steel market is very quiet. The Pennsylvania Railroad is in the market for about 500 tons for a bridge near Pittsburgh, and the Navy Department has received bids on 250 tons for two large gates for the new drydocks being built at Norfolk, Va. One of the buildings in the large radio station at Monroe, N. C., will require 250 tons. Bids were opened Dec. 30. Many of the steel companies are revising prices on jobbers' contracts. Bar iron rolling mills have not yet taken any action on prices, and are still quoting common iron at 3.50c., Pittsburgh, or 3.77c., New York. Makers of bolts, nuts and rivets assert that there will be no immediate reduction in prices. We quote mill shipments as follows: Steel bars, 2.97c.; shapes, 3.07c.; plates, 3.27c.; common bar iron, 3.77c.; refined bar iron, 5.27c., all New York. Out of store prices are as follows: Steel bars, 3.97c.; structural shapes, 4.07c.; plates, 4.27c.; No. 10 blue annealed sheets, 5.17c.; one-pass cold-rolled black sheets, No. 28 gage, 6.22c.; No. 28 galvanized sheets, 7.57c.; hoops, 4.57c.; bands, 3/16 in., Nos. 10 and 12, 4.57c.; shafting, plus 9 per cent of list.

Cast-Iron Pipe.—No action has been taken by cast-iron pipe shops in regard to prices and no business has developed. It is conceded that prices will be considerably lower as soon as any important buyer appears in the market. Recent Government prices which still prevail nominally are: \$67.70, New York, for 6-in. and heavier; \$70.70 for 4-in., \$77.70 for 3-in., and \$1 additional for Class A and gas pipe.

Old Material.—The old material market is extremely weak and still further recessions are announced on a number of grades, but cast scrap is holding up very well. We quote buying prices of dealers and brokers, per gross ton, New York, as follows:

Heavy melting steel.....	315.50 to \$16.00
Rerolling rails.....	22.00 to 23.00
Relaying rails.....	50.00 to 55.00
Iron and steel car axles.....	28.00 to 30.00
No. 1 railroad wrought.....	23.00 to 24.00
Wrought-iron track.....	15.00 to 16.00
Forge fire.....	14.00 to 15.00
No. 1 yard wrought, long.....	17.00 to 18.00
Light iron.....	6.00 to 7.00
Cast borings (clean).....	8.00 to 9.00
Machine shop turnings.....	8.00 to 9.00
Mixed borings and turnings.....	8.00 to 9.00
Iron and steel pipe (1 in. minimum diameter), not under 2 ft. long.....	16.00 to 17.00
Stove plate.....	19.00 to 20.00
Locomotive grate bars.....	19.00 to 20.00
Malleable cast (railroad).....	18.00 to 19.00
Old carwheels.....	24.00 to 25.00
Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, are:	
No. 1 machinery cast.....	\$28.00 to \$29.00
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	26.00 to 27.00
No. 1 heavy cast, not cupola size.....	22.00 to 23.00
No. 1 cast (radiators, cast boilers, etc.).....	23.00 to 24.00

Cincinnati

CINCINNATI, Jan. 7.—(By Wire.)

Pig Iron.—The market is slow in developing any new features. Furnace operators in the South especially are not seeking business because melters are not willing to contract ahead. Cancellation requests that have been received are still being urged and prove somewhat vexing. Until this question is cleared up, there is likely to be very little new business transacted. These cancellation requests come almost entirely from foundry melters whose output of castings is now far below their anticipations. Steel makers are taking all iron contracted for without question, although they are not putting out any inquiries for iron to be shipped very far

in the future. Very little iron of any kind has been sold for last half shipment. Stove foundries are now consuming about their usual amount of iron and the same is also true of agricultural implement manufacturers. The price question in the South and in southern Ohio is still unsettled, and while two Southern makers are quoting \$31 Birmingham for first half, they have sold practically no iron at this figure. Hanging Rock furnaces are holding off and on the few inquiries received are quoting a nominal figure of \$34 at furnace.

Based on freight rates of \$3.60 from Birmingham and \$1.80 from Ironton, we quote, f.o.b. Cincinnati:

Southern coke, No. 1 foundry and 1 soft.....	\$35.85
Southern coke, No. 2 foundry and 2 soft.....	34.60
Southern coke, No. 3 foundry.....	34.10
Southern No. 4 foundry.....	33.85
Southern gray forge.....	33.60
Ohio silvery, 8 per cent silicon.....	49.30
Southern Ohio coke, No. 1.....	34.05
Southern Ohio coke, No. 2.....	32.80
Southern Ohio coke, No. 3.....	32.30
Southern Ohio malleable Bessemer.....	33.30
Basic, Northern.....	31.80
Standard Southern carwheel.....	51.60

Finished Material.—The jobbers have reduced prices to conform to the new mill schedule, using the same differentials as heretofore. Warehouse business is very light, but mill agencies report specifications on bolts and nuts, steel pipe, bars, etc., as coming in freely. No intimations are given out that purchases made on the former prices will be held up by the buyer. On the other hand, material is urged forward on old orders.

The following are store prices: Steel bars, 3.93c.; steel bands, 4.53c.; small structural shapes, 4.03c.; plates, 3/16-in. and heavier, 4.23c.; blue annealed sheets, Nos. 8 to 16, 5.13c. base; cold rolled shafting, 9 per cent plus list; twisted bars, 4.05 1/2c., and wire nails, \$4.25 per keg base.

Coke.—There is practically no demand for foundry coke. The foundries are well provided for. While furnaces in southern Ohio have no over-supply of fuel, they are feeling somewhat easier on account of more prompt shipments from the different producing districts. An increase in production of 48-hr. coke is offset by reports that 72-hr. coke is not being made as fast in proportion with furnace fuel. No contracting is reported from any source.

High-Speed Steel.—A reduction has been made by practically all leading makers. However, this cut was a comparatively small one, and \$1.90 per lb. is the average price to-day. Locally business is somewhat dull, but orders received from outside manufacturers are fairly satisfactory.

Old Material.—The bottom seems to have dropped out of the scrap market. Buyers have practically abandoned the market and scrap offerings go begging. Dealers are not willing to add to their stocks until some kind of a definite level is reached. Scrap melters are pretty well supplied, and in the case of the steel mills they appear to be very loath to add to stocks on hand. The heavy supply of steel scrap is one cause for the very low value of steel turnings. Cast borings are also a drug on the market. The buying prices given below represent maximum figures at which dealers will take in scrap, but the uncertainty of the market makes them merely nominal quotations. The following are nominal buying prices f.o.b. cars, Cincinnati and southern Ohio, in carload lots:

Per Gross Ton

Bundled sheet	\$13.00 to \$13.50
Old iron rails.....	22.00 to 22.50
Relaying rails, 50 lb.....	35.00 to 36.00
Rerolling steel rails.....	20.00 to 21.00
Heavy melting steel.....	17.00 to 17.50
Steel rails for melting.....	18.00 to 18.50
Old carwheels	20.00 to 20.50

Per Net Ton

No. 1 railroad wrought.....	\$18.00 to \$18.50
Cast borings	7.00 to 7.50
Steel turnings	8.00 to 8.50
Railroad cast	20.00 to 20.50
No. 1 machinery	22.00 to 22.50
Burnt scrap	13.00 to 13.50
Iron axles	30.00 to 31.00
Locomotive tires (smooth inside).....	23.00 to 24.00
Pipes and flues.....	13.50 to 14.00
Malleable cast	15.00 to 16.00
Railroad tank and sheet.....	10.00 to 10.50

IRON AND INDUSTRIAL STOCKS

Wall Street More Cheerful—Railroad Stocks Show Upward Trend

NEW YORK, Jan. 7.

Wall Street seemed to be more cheerful last week and the security market had an upward trend. This change was not attributable to any fundamental condition, but was due to a large extent to the ending of the selling by stockholders who were aiming to establish losses for tax recording purposes. Although it is very uncertain as to whether the country will have Government ownership or private ownership, railroad stocks have been stronger. The very heavy selling of Liberty loan bonds was a feature of the past week.

The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com. 32 - 33	Int. Har. com. 112 - 117
Allis-Chalm. pf. 83	Int. Har. pf. 116
Am. Can com. 46 1/2 - 48 1/2	La Belle Iron pf.
Am. Can pf. 98 1/2 - 100	Lackaw. Steel .. 65 3/4 - 68 1/2
Am. Car & F. c. 90 1/2 - 93 1/2	Lake Supr. Corp. 16 - 18 1/2
Am. Car & F. pf. 114	Midvale Steel .. 41 1/2 - 44 1/2
Am. Loco. com. 60 1/2 - 62 1/2	Nat.-Acme 27 1/2 - 31
Am. Loco. pf. 102	Nat. En. & Stm. c. 47 - 49
Am. Radiator com. 295	N. Y. Air Brake. 98 1/2 - 105
Am. Ship com. 112	Nova Scotia Steel 52 1/2 - 54
Am. Ship pf. 89	Pittsb. Steel pf. 90
Am. Steel Fdries. 84 1/2 - 86 1/2	Pressed Steel c. 81 - 63
Bald. Loco. com. 73 1/2 - 76	Pressed Steel pf. 101
Beth. Steel com. 60 - 62 1/2	Ry. Steel Spg. c. 74 1/2 - 77 1/2
Beth. Steel Cl. B. 60 1/2 - 63 1/2	Ry. Steel Spg. pf. 105 - 105 1/2
Carbon Steel com. 94	Republic com. ... 74 - 75 1/2
Case (J. L.) pf. 91 1/2 - 92 1/2	Republic pf. 101 1/2 - 102
Chic. Pneu. Tool. 62 1/2 - 65	Sloss com. 49 1/2 - 101
Colo. Fuel 36 1/2 - 38 1/2	Superior Steel 36
Cruc. Steel com. 56 - 60 1/2	Transue-Williams 37 1/2
Crucible Steel pf. 89 1/2 - 95 1/2	Un. Alloy Steel. 38 - 39 1/2
Deere & Co. pf. 95 1/2 - 95 1/2	U. S. Pipe com. ... 14 1/2 - 14 1/2
Gen. Electric ... 149 - 151 1/2	U. S. Pipe pf. 43 1/2
Gt. No. Ore Cert. 31 1/2 - 32 1/2	U. S. Steel com. 92 1/2 - 96 1/2
Gulf States Steel 59 1/2 - 61 1/2	U. S. Steel pf. ... 112 1/2 - 114 1/2
Gulf S. Stl. 1st pf. 93 1/2	Westingh. Elect. ... 40 7/8 - 42

Dividends

The American Shipbuilding Co., quarterly, 1 1/4 per cent and extra 2 1/4 per cent on the common, payable Feb. 1.

The E. W. Bliss Co., quarterly, 1 1/4 per cent and extra 10 per cent on the common, and 2 per cent on the preferred, payable Jan. 2.

The Chicago Pneumatic Tool Co., quarterly, 1 1/2 per cent on the common, payable Jan. 25.

The Sharon Steel Hoop Co., quarterly, 2 per cent on the common and 1 1/4 per cent on the preferred, payable Jan. 16.

The Wheeling Mold & Foundry Co., quarterly, 1 per cent and extra 3 per cent on the common, payable Feb. 1.

The American Laundry Machinery Co., quarterly, 1 1/4 per cent on the preferred, payable Jan. 15.

The American Screw Machinery Co., quarterly, 1 1/4 per cent and extra 2 per cent, payable Dec. 31.

The American Seeding Machine Co., quarterly, 1 per cent on the common and 1 1/2 per cent on the preferred, payable Jan. 15.

The Atlantic Steel Co., quarterly, 1 1/2 per cent and extra 5 per cent on the common, payable Jan. 2.

The Canadian Locomotive Co., quarterly, 1 1/2 per cent on the common and 1 1/4 per cent on the preferred, payable Jan. 1.

The Central Foundry Co., quarterly, 1 1/4 per cent on the preferred and 2 per cent on the first preferred, payable Jan. 15.

The Elyria Iron & Steel Co., quarterly, 1 1/4 per cent on the preferred, payable Jan. 2.

Fairbanks, Morse & Co., 3 per cent on the common, payable Jan. 1.

The General Fireproofing Co., quarterly, 1 1/4 per cent on the common and preferred, payable Jan. 1.

The Harbison-Walker Refractories Co., extra 6 per cent on the common, payable Jan. 25.

The Lukens Steel Co., quarterly, 1 1/4 per cent on the common, payable Jan. 15.

The National Tool Co., quarterly, 3 per cent on the common and 1 1/4 per cent on the preferred, payable Jan. 2.

The Pittsburgh Steel Co., quarterly, 2 per cent on the common, payable Jan. 1.

The Superior Steel Co., quarterly, 1 1/2 per cent on the common, payable Feb. 1, and 2 per cent on the first and second preferred, payable Feb. 15.

The Transue & Williams Steel Forgings Co., quarterly, \$1.25 on the common, payable Jan. 15.

The Thomas Iron Co., 6 per cent, payable Feb. 1.

The Westinghouse Electric & Mfg. Co., quarterly, 87 1/2c. on the common, payable Jan. 31, and 87 1/2c. on the preferred, payable Jan. 15.

The Wheeling Mold & Foundry Co., quarterly, 2 per cent on the preferred, payable Jan. 2.

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery									
Copper, New York		Tin, New York		Lead		Spelter			
Jan.	Lake	Electro-	New	New	St.	New	St.		
2.....	23.00	23.00	71.50	5.75	5.45	7.95	7.60		
3.....	22.00	22.00	71.50	5.75	5.45	7.95	7.60		
4.....	21.50	21.50	...	5.75	5.45	7.90	7.55		
6.....	21.00	21.00	71.50	5.75	5.45	7.85	7.50		
7.....	21.00	21.00	71.50	5.75	5.45	7.85	7.50		

NEW YORK, Jan. 7.

All the markets are extremely dull. They are all unrestricted except tin. Copper is offered at lower prices with few buyers. Tin is extremely inactive. Lead shows more life at lower levels. Spelter is largely nominal and easier on light buying. Antimony is quiet and unchanged.

New York

Copper.—Leading producers continue to ask 23c. for copper for both domestic or foreign consumption, but there are others who are said to be offering as low as 21c. for January delivery and to have made sales at this level. The fact is that there is almost no demand, foreign or domestic, the inclination of consumers being to wait. Such demand as does appear is apparently being satisfied by the producers mentioned or by resale metal. We quote the market as nominal at 21c., New York, for early delivery. Production of the metal is said to have already been curtailed measurably, some placing it at 70 per cent of former capacity. Thus far there has been very little foreign inquiry, most of the leading governments having large stocks. It is thought by some that foreign inquiry will not develop until the second quarter.

Tin.—There is no activity at all in tin. The small amounts held by outsiders are still being offered with no takers and consumers are well stocked. These two facts seem to indicate that the United States Steel Products Co. is not disposing of its metal very quickly. A continuance of these conditions means a long period of control, for consumers will not purchase if they can help it. They are also dissatisfied with the entire situation and this is emphasized by the fact that offers of Straits tin for shipment from the East are being made at 53c. c.i.f. New York, as against the fixed price of 72.50c. Importations are impossible and buyers cannot take advantage of these prices. Deliveries of tin in December were 4050 tons, of which 3950 tons came through Pacific ports; stocks and landing on Dec. 31 were 185 tons. The 1918 imports were 58,027 tons as against 54,867 tons in 1917. Of the 1918 imports, 34,243 tons were Straits tin. Spot Straits tin in London, Jan. 6, was quoted at £244 per ton.

Lead.—The lead market is stabilizing itself sooner than any other. There has been a good inquiry the past week and early last week some business was done as low as 5.25c., New York, after which the market jumped back to 5.50c. and then 5.75c., for early delivery, where it is at present. The market may be characterized as firm and steady at 5.75c., New York, for early delivery and at 6c., New York, for spot, with very little metal to be had below these prices. A little business has been done but it has not been large.

Spelter.—Demand is very light and the market continues to ease on the small sales of a few producers, most of the larger ones being well booked and not desiring to press the market. Prime Western for early delivery is quoted at 7.50c., St. Louis, or 7.85c., New York, with some asking 7.65c., St. Louis, or 8c., New York, both largely nominal.

Antimony.—The market is nominal at 7.62½c. to 7.75c., New York, duty paid, for wholesale lots with demand very light.

Aluminum.—It is understood that the maximum prices for No. 1 virgin aluminum and for scrap will continue in force until March 1, the original date set. These prices are 33c. per lb. for 50-ton lots, 33.10c. per lb. for 15 to 50-ton lots and 33.20c. per lb. for 1 to 15-ton lots.

Old Metals.—As soon as inventories are finished, it is expected that inquiries from consumers will come into the market and stabilize it. The past week has been very dull. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	21.00
Copper, heavy and wire	19.50
Copper, light and bottoms	16.50
Brass, heavy	14.00
Brass, light	10.50
Heavy machine composition	20.00
No. 1 yellow rod brass turnings	11.00
No. 1 red brass or composition turnings	16.50
Lead, heavy	5.25
Lead, tea	4.00
Zinc	5.50

Chicago

JAN. 7.—All the metals are quiet and prices cannot be called strong. Nominally held at 23c., copper has been sold at less, the offerings being from canceled war contracts. In tin no activity is in sight. Lead has been relatively more active than any other metals, and some has been sold at concessions. Spelter and antimony are lifeless, with lower Pacific Ocean freights making the latter easier. We quote copper at 23c. for carloads; tin, 75c. to 77c.; lead, 5.80c.; spelter, 7.75c.; antimony, 9c. to 9.50c. On old metals we quote copper wire, crucible shapes, 15.50c.; copper clips, 15c.; copper bottoms, 14c.; red brass, 15c.; yellow brass, 10c.; lead pipe, 4.25c.; zinc, 4.50c.; pewter, No. 1, 30c.; tinfoil, 35c., and block tin, 45c.

St. Louis

JAN. 7.—The non-ferrous metal markets are quiet, with lead in carload lots quoted at 5.05c. and in less than carloads at 5.75c. Spelter in carloads is quoted at 7.50c.; tin at 72.50c.; copper nominal, and Asiatic antimony at 10c. In the Joplin district zinc blende, 60 per cent, top grades, is quoted at \$55 per ton, second grades ranging down to \$40 per ton. Calamine, 40 per cent, is held at \$30 to \$40 per ton, with lead ore, 80 per cent, at \$65 per ton. On miscellaneous scrap metals, we quote dealers' buying prices as follows: Light brass, 9c.; heavy yellow brass, 11c.; light copper, 15c.; heavy copper and copper wire, 17c.; heavy red brass, 16c.; pewter, 40c.; tinfoil, 48c.; tea lead, 5c.; lead, 5c.; zinc, 4.50c.; aluminum, 19c.

A bill now before Congress provides that the Federal Board for Vocational Education, in co-operation with the several states, shall provide facilities for training and retaining men and women crippled in the pursuits of peace. The work would follow the lines of rehabilitation now being employed for reclaiming crippled soldiers for useful occupation.

The Brier Hill Steel Co., Youngstown, Ohio, last week placed in operation the 132-in. plate mill, companion unit of the 84-in. mill. The unit will roll plates up to 2 in. in thickness, 120 ft. wide and lengths up to 80 ft. It is of the reversible type and by slight adjustments may be converted into a 144-in. mill.

Sheet metal contractors at Newark, N. J., have formed a permanent association for co-operation and regulation in matters regarding sheet metal work. The organization will arrange working agreements with the trade and handle other matters of importance to its members.

The McCrosky Reamer Co., Meadville, Pa., has changed its name to the McCrosky Tool Corporation.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Nov. 1, 1918, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 24.5c.; Boston, 30c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c.; Omaha, 59c.; minimum carload, 36,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, \$1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is \$1.315, minimum carload 40,000 lb.; and \$1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c., minimum carload 46,000 lb.; Denver, 99c., minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs.

Structural Material

I beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, structural sizes, 2.80c.

Wire Products

Wire nails, \$3.50 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails taking an advance over this price of \$2, and shorter than 1 in., \$2.50. Bright basic wire, \$3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3.25; galvanized wire, \$3.95; galvanized barb wire and fence staples, \$4.35; painted barbed wire, \$3.65; polished fence staples, \$3.65; cement-coated nails, \$3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 47 per cent off list for carload lots, 46 per cent for 1000-rod lots, and 45 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....	\$4.40 base
Large boiler rivets.....	\$4.50
7/16 in. x 6 in. smaller and shorter rivets.....	50-10 per cent off list
Machine bolts h.p. nuts, ½ in. x 4 in.:	
Smaller and shorter, rolled threads.....	50-10-5 per cent off list
Cut threads.....	50-5 per cent off list
Larger and longer sizes.....	40-10 per cent off list
Machine bolts, c.p.c. and t. nuts, ½ in. x 4 in.:	
Smaller and shorter.....	40-10 per cent off list
Larger and longer.....	35-5 per cent off list
Carriage bolts, ½ in. x 6 in.:	
Smaller and shorter, rolled threads.....	50-5 per cent off list
Cut threads.....	40-10 per cent off list
Larger and longer sizes.....	40 per cent off list
Lag bolts.....	50-10 per cent off list
Plow bolts, Nos. 1, 2, 3.....	50 per cent off list
Hot pressed nuts, sq. blank.....	2.50c. per lb. off list
Hot pressed nuts, hex. blank.....	2.30c. per lb. off list
Hot pressed nuts, sq. tapped.....	2.30c. per lb. off list
Hot pressed nuts, hex. tapped.....	2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank.....	2.25c. per lb. off list
Semi-finished hex. nuts:	
5/8 in. and larger.....	60-10-10 per cent off list
9/16 in. and smaller.....	70-5 per cent off list
Stove bolts.....	70-10 per cent off list
Stove bolts.....	21½ per cent extra for bulk
Tire bolts.....	50-10-5 per cent off list

The above discounts are from present lists now in effect.

All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, \$57; chain rods, \$65; screw, rivet and bolt rods and other rods of that character, \$65. Prices on high carbon rods are irregular. They range from \$70 to \$80, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. x 4 1/2 in. and heavier, per 100 lb., \$3.70, in lots of 200 kegs of 200 lb. each, or more; track bolts, \$4.90. Boat spikes, \$5.05 per 100 lb., f.o.b. Pittsburgh.

Terne Plate

Prices of terne plate are as follows: 8-lb. coating, 200 lb., \$14.50 per package; 8-lb. coating, I. C., \$14.80; 12-lb. coating, I. C., \$16.50; 15-lb. coating, I. C., \$17.50; 20-lb. coating, I. C., \$18.75; 25-lb. coating, I. C., \$20.00; 30-lb. coating, I. C., \$21.00; 35-lb. coating, I. C., \$22.00; 40-lb. coating, I. C., \$23.00 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.70c. from mill. Relined iron bars, \$5.00c.; common iron bars, 3.50c. in carload and larger lots, f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card.

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
1/8, 1/4 and 5/8.....	47	20 1/2	1/8 and 1/4.....	26	+1
1/2.....	51	36 1/2	5/8.....	27	List
5/8 to 3.....	54	40 1/2	1/2.....	31	13
			3/4 to 1 1/2.....	36	20

Lap Weld		
2.....	47	34 1/2
2 1/2 to 6.....	50	37 1/2
7 to 12.....	47	33 1/2
13 and 14.....	37 1/2	2 1/2 to 6.....
15.....	35	7 to 12.....

Butt Weld, extra strong, plain ends		
1/8, 1/4 and 5/8.....	43	25 1/2
1/2.....	48	35 1/2
5/8 to 1 1/2.....	52	39 1/2
2 to 3.....	53	40 1/2

Lap Weld, extra strong, plain ends		
2.....	45	33 1/2
2 1/2 to 4.....	48	36 1/2
4 1/2 to 6.....	47	35 1/2
7 to 8.....	43	29 1/2
9 to 12.....	38	24 1/2

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh:

Lap Welded Steel	Charcoal Iron
3 1/2 to 4 1/2 in.....	37
2 1/2 to 3 1/4 in.....	27
2 1/4 in.....	20 1/2
1 3/4 to 2 in.....	16

Standard Commercial Seamless—Cold Drawn or Hot Rolled	Per Net Ton	Per Net Ton
1 in.	\$334	1 1/4 in.
1 1/4 in.	27	2 to 2 1/2 in.
1 3/4 in.	264	2 1/2 to 3 1/4 in.
1 1/2 in.	214	4 in.

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots are as follows:

Blue Annealed—Bessemer	Cents per lb.
No. 8 and heavier.....	3.85
Nos. 9 and 10 (base).....	3.90
Nos. 11 and 12.....	3.95
Nos. 13 and 14.....	4.00
Nos. 15 and 16.....	4.10

Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21.....	4.50
Nos. 22 and 24.....	4.55
Nos. 25 and 26.....	4.60
No. 27.....	4.65
No. 28 (base).....	4.70
No. 29.....	4.80
No. 30.....	4.90

Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11.....	5.05
Nos. 12 and 14.....	5.15
Nos. 15 and 16.....	5.30
Nos. 17 to 21.....	5.45
Nos. 22 and 24.....	5.60
Nos. 25 and 26.....	5.75
No. 27.....	5.90
No. 28 (base).....	6.05
No. 29.....	6.30
No. 30.....	6.55

Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16.....	4.50
Nos. 17 to 21.....	4.55
Nos. 22 to 24.....	4.60
Nos. 25 and 27.....	4.65
No. 28 (base).....	4.70
No. 29.....	4.75
No. 30.....	4.75
Nos. 30 1/2 and 31.....	4.80

PERSONAL

William S. Rogers, Buffalo, was admitted to the firm of Rogers, Brown & Co., pig iron merchants, on Jan. 1.



WILLIAM S. ROGERS

instructor at the School of Fire for Field Artillery at Fort Sill, Oklahoma, and was honorably discharged from service in December, 1918.

Amasa Stone Mather, son of Samuel Mather, of Pickands Mather & Co., Cleveland, on Jan. 1, was admitted to membership in that firm, with which he has been connected for a number of years, in its ore mining department. He was attending an officers' training camp when the armistice was declared.

A. C. Ryan has resigned as manager of the plant of the Cromwell Steel Co., Lorain, Ohio, in order to attend to private business interests in Cleveland. The management for the present will be under the charge of J. C. Cromwell, who erected the plant, and is one of the directors. The Cromwell plant was to have started up Jan. 1, but operations have been delayed by an accident in the plant of a power company that furnishes electricity for the steel plant. It is expected that operations will be resumed in both the open hearth and mill departments about Jan. 15.

E. W. McDonald, comptroller and assistant treasurer of the Truscon Steel Co., Youngstown, Ohio, will enter upon his new duties as assistant cashier of the National Bank of Commerce, New York, about Jan. 15. He will be succeeded at Youngstown by W. J. T. Davis, who has been his assistant.

N. J. Clarke, secretary Upson Nut Co., Cleveland, who for some time has been connected with the Ordnance Department in Washington, with the rank of major, has returned to Cleveland and assumed his regular duties.

Henry Ford has resigned the presidency of the Ford Motor Co., Detroit, to devote his time to his new weekly newspaper, *The Dearborn Independent*, and his tractor plant at Dearborn, Mich. His son, Edsel B. Ford, succeeds him, and B. J. Craig, formerly assistant secretary, will be the new treasurer.

L. C. Reynolds, formerly with the Oakland Motor Car Co., Pontiac, Mich., has been made manager of the General Motors Corporation plant in Detroit.

The King Motor Car Co., Detroit, has accepted the resignation of J. B. Seigried, general manager.

Paul L. Odle, well known in the automotive industry, has joined the Parrett Tractor Co., Chicago. He was formerly associated with both the Republic and Denby Motor Truck companies, and was manager of purchases of the latter concern prior to joining the Motor Transport Corps of the United States Army.

Charles F. Ames, for the past three years New York sales manager for the Epping-Carpenter Pump Co., Pittsburgh, has resigned and has organized the firm of Charles F. Ames & Co., hydraulic and contracting engineers and dealers in pumping machinery, which has opened offices at 90 West Street, New York. F. F. Woods, sales manager of the Epping-Carpenter Pump Co., has moved from Pittsburgh to New York and will represent that company in the New York territory.

First Lieut. Richard K. Durkan, formerly manager of the Warren Steel Casting Co., St. Louis, was wounded in action on Oct. 12, his relatives have just learned. He has, however, recovered and was enroute to rejoin his regiment at Coblenz, Germany, when he wrote home of his wounds.

T. T. Read, until recently in the service of one of the Government bureaus at Washington doing war work, is now in the professional section of the United States Employment Service, 16 East Forty-second Street, New York.

Wiley L. Byers, for six and one-half years sales manager for the Producers' Coke Co., Uniontown, Pa., and during the war assistant regional director and manager of production for Fayette County, Pa., of the United States Fuel Administration, has resigned his position with the Producers' company to enter into the brokerage business early in the spring, specializing in by-product coal.

S. M. Williams, for the past four years sales manager of the Garford Motor Truck Co., Lima, Ohio, has been placed at the head of a new department of that company to be known as the department of highway development, and has been succeeded as sales manager by J. E. Bowman, who has been director of sales of the Federal Motor Truck Co., Detroit.

Henry A. Butler, Youngstown, Ohio, formerly in charge of the cost department of the Youngstown Sheet & Tube Co., who recently went to France to serve with the Red Cross, has been given charge of the home service section of the Home and Hospital Bureau, American Red Cross, in Paris, with the commission of captain. He is located with his nephew, John W. Ford, attorney, son of E. L. Ford, director of the Youngstown Sheet & Tube Co.

R. A. Byrns, first lieutenant of Company L, 10th United States Infantry, who was formerly New York sales manager for the Northern Engineering Works, Detroit, crane builder, returned to New York last week from France, where he saw active service.

He was wounded at Le Catelet on Sept. 29, an elbow joint being shot away. Lieut. Byrns' company had its full strength of 250 men at the time it reached the battle front. In its last battle only 150 men went into action and of these only 27 were left, all the others being killed, wounded or captured. Lieut. Byrns was wounded twice in the battle of Le Catelet, the first wound being caused by a machine-gun bullet. After receiving temporary aid at a field dressing station Lieut. Byrns rejoined his company, and finding that the captain had been killed, he took command, reorganized the company and led it until he was later brought down by a shell wound in the arm. For this service he has received the British military medal and the American distinguished service cross. Lieut. Byrns, after a few months' rest, will again represent the Northern Engineering Works in New York.



R. A. BYRNS

Robert R. McLean, an operating engineer of the City Council of Melbourne, Australia, was in Pittsburgh last week and stated that Australia would be a very heavy buyer from the United States of steel rails for railroad improvements, steel for ship building, machinery and other steel products to be shipped to Australia. Mr. McLean was in Pittsburgh to inspect electrical equipment in the large steel and other manufacturing plants in the Pittsburgh district, largely for the purpose of finding means to make possible the use of brown lignite as a substitute for coal for manufacturing purposes in Australia.

Frank W. McLean, formerly vice-president and general manager, Pittsburgh Rivet Co., is now connected with the sales department of the Garland Mfg. Co., Pittsburgh, manufacturer of nuts and rivets, with works at West Pittsburgh, Pa. Mr. McLean has charge of sales in the Pittsburgh, Wheeling and other nearby districts.

Emerson Knoff, sales agent in Seattle for the United States Steel Products Co., has resigned, to become vice-president of the Gerrard Wire Tying Machine Co., with head offices in Chicago.

Thomas P. Orchard, formerly production manager on the Browning machine gun tripods, with the New Britain Machine Co., New Britain, Conn., has joined the Service Engineering Co., planning and quantity production specialists, 25 Church Street, New York, as sales manager.

Additional changes in the official personnel of the operating forces of the Lackawanna Steel Co.'s plant at Buffalo have been announced, as follows: T. H. Mathias, formerly assistant general superintendent, has been appointed general superintendent, succeeding G. F. Downs, who has been made a vice-president in charge of operation, and G. W. Whitehead, formerly assistant superintendent, who has been appointed assistant general superintendent. Both of the new appointees have their headquarters in the general offices of the company at the plant.

James J. Shanahan has been appointed general manager of the Chicago and Moline offices of the E. L. Essley Machinery Co., 551-557 Washington Boulevard. Mr. Shanahan has been with the company seven years, and prior to then was with other machine-tool companies.

George A. French, formerly with the Cutter & Wood Supply Co., Boston, where he acted especially as representative of the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., has joined the New York sales office of the latter company as sales engineer.

Effective Dec. 31, H. F. Devens resigned as vice-president and also as a director of the Superior Steel Corporation, maker of hot and cold rolled strip steel, Pittsburgh, with works at Carnegie, Pa. Mr. Devens was connected with this company for 13 years, and has no immediate plans for the future. He will spend the winter in Florida, returning to Pittsburgh in April.

Floyd Rose has been appointed secretary of the Hephrenstall Forge & Knife Co., Pittsburgh. After being connected with the Carbon Steel Co. and also with the Portsmouth Steel Co., Portsmouth, Ohio, he went to Pittsburgh in 1909, forming the firm of Floyd Rose & Co., inspecting and metallurgical engineers. In May, 1918, he entered the United States Ordnance Department as manager of the artillery division, Pittsburgh district, having charge of inspection of gun forgings at various plants in the Pittsburgh district.

John Wheeldon, who has recently been connected with the Elyria Iron & Steel Co., Cleveland, has returned to his former home in Worcester, Mass., and will be associated with the Spencer Wire Co. Mr. Wheeldon was for over 25 years connected with the Worcester and New Haven mills of the American Steel & Wire Co., starting in as a boy and working up to the superintendency of the steel and rod mills.

Officers of the George W. Moore Co., succeeding Moore & Lorenz Co., 2144 Fulton Street, Chicago, are:

George W. Moore, president and treasurer; Max H. Hurd, formerly secretary, Union Iron Works, Decatur, Ill., vice-president; and P. G. Hinkley, secretary.

The Clarge Fan Co., Kalamazoo, Mich., announces the return of Lieutenant Louis O. Monroe to its organization, to assume duties as manager of sales and chief engineer. Mr. Monroe was previously in charge of the Chicago office of the company.

J. C. Vaught, engineer for the American International Shipbuilding Corporation, United States Shipping Board, Emergency Fleet Corporation, has returned to Evansville, Ind., where he will be located with the International Steel & Iron Co.

Horace V. Winchell, mine geologist, Minneapolis, has been nominated for president of the American Institute of Mining Engineers for the year beginning in March. Edwin Ludlow, second vice-president Lehigh Coal & Navigation Co., Lansford, Pa., and A. R. Ledoux, Ledoux & Co., New York, have been nominated for vice-presidents. For other directors the nominations are: J. V. W. Reynders, New York; George D. Barron, Rye, N. Y.; Charles F. Rand, New York; Louis F. Cates, Ray, Ariz., and Stanley A. Easton, Kellogg, Idaho. The membership is voting on the proposal approved by the board of directors that the name of the society be changed to the American Institute of Mining and Metallurgical Engineers.

L. N. Ralph, formerly assistant secretary and assistant treasurer, Ordnance Department, United States Steel Corporation, has resigned and is now vice-president of the H. N. Trimble Steel Co., Oliver Building, Pittsburgh.

S. E. Hackett, who has been sales manager of the Chicago office of the Jones & Laughlin Steel Co., has been made general manager of sales of that company, succeeding the late John L. Haynes.

E. F. Carry has resigned from the office of chairman of the Port and Harbor Facilities Commission of the United States Shipping Board, to give his attention to the affairs of the Haskell & Barker Car Co., Chicago. Mr. Carry became associated with the Shipping Board Oct. 9, 1917, and under his supervision as director of operations that department assembled information in regard to the location and daily movements of every merchant vessel operated by the War Department, the Navy Department and the Shipping Board.

H. L. Skinner, who resigned as secretary, director and sales manager of Shibakawa & Co., Inc., New York, some time ago, has accepted a position as general manager of the Steel Products Export Corporation, 120 Broadway, New York. Mr. Skinner has had long experience in the export business.

Purchasing Agents of St. Louis

At a recent meeting of The Purchasing Agents Association of St. Louis, the following officers were elected: F. W. Russe, Mallinckrodt Chemical Works, president; Frank A. Smith, Jr., St. Louis Refrigerator & Cold Storage Co., vice-president; Walter M. Lowry, National Lead Co., secretary; J. A. A. Hecker, Curtis Mfg. Co., treasurer, and Kirk Bonnell, Brecht Co., Kirk Taylor, Illinois Glass Co., John Niewohner, Ruemmeli-Dawley Mfg. Co., directors.

The organization of purchasing agents of St. Louis is resulting in the exchange of ideas and opportunities for closer relationship. It is fostering and promoting among the members at the meetings and elsewhere, by means of speeches, discussions and whatever other means possible, a more thorough knowledge of the products bought by the members, more uniform and efficient purchasing routine and methods, better standardized specifications, classifications, etc., and more improved methods for disseminating market information; and is securing the advance of purchasing to a higher level and the individual betterment of its members. The discussion of prices, discounts or other confidential information is not tolerated during any meeting of the association.

ACID-RESISTING IRON

Developments in Its Production—Physical Constants—Use as Metallurgical Anodes

Developments in the manufacture of acid-resisting iron, especially for chemical plant purposes, were recently discussed before the London (England) section of the Society of Chemical Industry by Sidney Tungay.

It had long since been proved in the laboratory, he said, that a pure form of iron could be rendered resistant to either sulphuric or nitric acid by the addition of a suitable proportion of silicon, chromium or other elements, but the development of such metals upon an industrial and commercial basis was not approached until some 20 years ago. In more recent years the development of the electric furnace had proved a valuable aid in the satisfactory commercial production of such alloys as ferrosilicon and ferro-chromium. Tests made by Kowalke, in America, had shown that silicon present in a lesser quantity than 12 per cent did not promote satisfactory resistance to corrosion, while when it reached 19 per cent or more the acid-resisting quality of the alloy again fell. In addition to the difficulties presented by the serious shrinkage of non-corrosive iron castings during cooling, which amounted to slightly over $\frac{1}{4}$ in. per ft. in each direction as compared with a shrinkage of about 3.32 in. per ft. in the case of ordinary cast iron, the presence of graphite in any considerable quantity caused disaster. The iron must also be low in carbon and phosphorus, otherwise during the process of cooling these compounds tended to separate out and form eutectics.

These difficulties, however, had been largely overcome by suitable furnaces and by improved manipulation in mixing the metal, with the result that in present commercial practice it was found quite possible to produce a satisfactory acid-resisting iron, though its application to the manufacture of plant for the chemical industry had not until recently been completely successful. The following were the physical constants of acid-resisting iron as compared with cast iron:

	Cast-Iron	Acid-resistant Iron
Density	7.3	6.8
Tensile strength (tons per sq. in.)	9 to 10	6 to 7
Melting point (deg. C.)	1150	1200
Hardness	24	35
Heat conductivity	10	8
Electrical resistance	8	10
Contraction per ft. in casting (in.)	3/32	9/32
Crushing (1-in. cubes) (tons)	40	34

The heat transmitting power of acid-resisting iron had been calculated at 10 times that of stoneware or quartz, and thus the parts could be made much smaller. A condenser built of acid-resisting iron condensed a charge of nitric acid in 16 hr., as against 36 hr. with a similar condenser built of pottery. With all this success there were still difficulties to be overcome. All alloys of low-silicon content, say, 10 per cent, were attacked very readily by certain acids, and while acid-resisting iron which contained from 16 to 18 per cent was satisfactory from the resistance to acid point of view, it was so very hard that it was impossible to machine it in any other way than by grinding with high-speed abrasives.

Apart from chemical plant, this iron had a wide application for anodes in connection with electro-metallurgical processes. On the outbreak of the war it was impossible to obtain magnetite anodes, since these were chiefly made in Germany, and a substitute was found in acid-resisting iron. While the material was not absolutely unacted upon when used for this purpose in copper sulphate solution, many times its original weight of copper could be deposited before the anode showed any serious signs of corrosion. The mechanical strength was a further considerable advantage, although a little higher electrical energy was required than with anodes made of magnetite.

In the course of a discussion Capt. Goodwin said there was a curious difference in the various makes of iron of this kind. In the United States the silicon

content was about 15 per cent, yet other manufacturers had 0.3 per cent, and another $2\frac{1}{2}$ per cent of manganese, and it would seem that better results would have been obtained if some of the manufacturers had employed chemists to advise them. There had been great difficulty in dealing with hydrochloric acid; so far as he was aware, only one alloy had been evolved which would stand that, and the silicon content in that case was from 16 to 20 per cent. Manufacturers would do very much better if they pooled their interests and spent money on research.

J. W. Hinchley said there were some obvious faults in the comparison of physical constants given in the paper. The figures for heat conductivity and electrical resistance were incorrect. The question of machining the material was not as hopeless as it might appear. It was possible with some brands, which had good acid resistance, to do some fairly satisfactory drilling and machining if the tools were properly chosen in the first instance.

Mr. Bannister stated a primary cause of failure in these metals was porosity, although sometimes this was quite minute and only discernible under microscopic examination. Another important point was the amount and nature of the graphite present. He had found castings to behave perfectly well, varying considerably in manganese from below 0.5 per cent to 2 per cent.

Walter Reid thought that if the metal was subjected after casting to the heat treatment that had been found so useful in steel, it could be made very much tougher and able to withstand shocks better than it did now.

Westinghouse Electric to Build Electric Locomotives at Essington

Discussing prospects for 1919 at the Essington, or South Philadelphia works of the Westinghouse Electric & Mfg. Co., R. B. Mildon, assistant to the vice-president, said:

We share the general opinion in the industrial field that business will slow down somewhat owing to the readjustment of the industries from a war to a peace basis; but by spring this phase should be over and then for the next few years we should have a period of prosperity.

As far as the Westinghouse works at Essington is concerned, we have enough orders on hand to keep us busy for the next year without considering new business, which is now beginning to develop. We are at present making nothing there but ship-propulsion machinery, but our plans contemplate bringing to Essington all of our turbine and electric generator construction work that is now being handled at East Pittsburgh. Before we can accommodate this additional business, however, we shall have to build several new buildings, including an office building, a shop for making turbine blades, and an electric generator shop. Unless we are mistaken in our expectations, however, this new construction work will begin next spring.

Looking a little farther into the future, it is probable that we shall in time erect a building for the construction of electric locomotives. The electric railroad situation is unquestionably very favorable, and a large amount of electrification will be undertaken in the next 10 years. We co-operate with the Baldwin Locomotive Works in the manufacture of electric locomotives and our location at Essington so close to the Baldwin plant, makes this the proper place to do our part of the work.

In other words, we plan to build at Essington all of our large and important apparatus, and as the demand for this class of apparatus is certain to increase rapidly from year to year, we expect to see our plant expand in the near future to many times its present size.

Price of High-Speed Steel Reduced

PITTSBURGH, June 7—(By Wire).

Makers of best grades of high-speed steel are now quoting \$1.90 per lb. base, instead of \$2 base, as formerly, while treated bits for tool holders are quoted at \$2.40 per lb. instead of \$2.50 per lb., as formerly, and semi-high-speed steel, 11 to 13 per cent tungsten, is \$1.65 base, instead of \$1.75 base, as formerly, all these prices being f.o.b. at point of shipment, terms 30 days, net.

British and German Metal Rolling Compared

The subject of the rolling of metals was treated at a meeting of the Birmingham Metallurgical Society (British) recently in papers by W. H. A. Robertson, of Bedford, and F. Johnson, head of the metallurgical department of the Birmingham Technical School. Isaac E. Lester, president of the society, was in the chair.

Mr. Robertson referred to the fact that before the war German makers of rolling machinery were pre-eminent in the high-grade finish of their mills. But during the last three years English makers had made such strides that they could produce rolling plant in every way superior to that of Germany. Among other points in which improvement had been made was the use of steel for the rolls. Since the commencement of the war extensive experiments had been made, largely under the direction of Sir Robert Hadfield, and now a special steel roll was being turned out in England which was superior to the German steel roll, and would enable manufacturers to roll successfully sheets of the finest gage.

Mr. Johnson, in his paper, dealt principally with the metallurgy of the subject, pointing out the changes which metal undergoes in the process of rolling.

In a discussion which followed Prof. T. Turner said it was perfectly clear that the sheet-metal trade in Birmingham required a good deal of revision. Unless there was a greater possible cleanliness all round, they would get particles of sand or grit or oxide on the surface which would roll in and cause trouble. A rolling mill ought to be one of the cleanest places. One reason why Continental manufacturers obtained better results was that they had a considerable trade and could roll continuously in the same rolls sheets of a particular gage.

The president said that in the past Austria and Germany and Italy had obtained a trade in this country for their rolls by specializing in rolls for certain classes of work. He did not want the meeting to end with the impression that Staffordshire, the original home of rolling, was behind the times. Before the war Staffordshire was making rolls for Italy, Austria and Germany in large quantities.

W. H. Henman thought the finish achieved by the Germans in their sheets was not altogether due to the mills. Much of the trouble as to the appearance of sheets, etc., was due to their being taken direct to the rolls from water which was highly acid. Another bugbear was that they used oil impregnated with grit. The condition of British rolling mills generally was a disgrace. The floors were dirty, and grit accumulated to an enormous extent. In many cases they had annealing muffles right in the mill itself, and grit came down upon the sheets while they were actually passing through the rolls.

Blaw-Knox Co. Convention

The annual convention of salesmen and other employees of the Blaw-Knox Co., Pittsburgh, was held recently at Wheatland, Pa., and Hoboken, Pa., the company having plants at both places. The first day was given to an inspection of the shops at Hoboken and a discussion on buckets and mixers, followed by luncheon. At the afternoon session, there was discussion on concrete forms, structural work, transmission towers, plate work, etc. The next day, there was a trip to Wheatland, Pa., where a discussion was held on the Knox devices and welded work, and also on plate work. Luncheon was served at the Wheatland hotel. On the third and final day, there was a general discussion in its offices in Pittsburgh on all products made by the company, followed by a banquet for the men at the Concordia Club, and for the women at the William Penn Hotel.

The partnership doing business as Wheelock, Lovejoy & Co., Cambridge, Mass., dealers in high-speed and special steels, has been dissolved and the business taken over by Wheelock, Lovejoy & Co., Inc.

OBITUARY

HENRY H. STAMBAUGH of Youngstown, Ohio, aged 60, identified with the development of the iron and steel industry in the Mahoning Valley for the past 40 years, died suddenly Jan. 4 in New Orleans, La., while on his way to California to spend the winter. Mr. Stambaugh was one of the organizers of the Brier Hill Steel Co., of which he was a director at the time of his death. For five years, from 1912 until 1917, he served as chairman of the board, the first to discharge these duties. For 12 years he was a director in the Youngstown Sheet & Tube Co., retiring about three years ago, although retaining heavy holdings. He was a director in the Bessemer Limestone Co., Tod-Stambaugh Co., Cleveland; First National Bank, Dollar Savings & Trust Co., Realty Guarantee & Trust Co., which he helped organize, and the Stambaugh-Thompson Co. He was also a director of the old William Tod Co., absorbed by the United Engineering & Foundry Co. From 1883 until 1912 he was actively engaged with the old Brier Hill Iron & Coal Co., which his father, John Stambaugh, promoted. The former served as secretary and treasurer and was president at the time it was merged with other companies to form the Brier Hill Steel Co. Mr. Stambaugh was active in the community, and duties as chairman of the committee in charge of the War Savings Stamp campaign in Mahoning County weakened his health. He was deeply interested in charities. Surviving relatives include John Stambaugh, a brother, treasurer and director of the Brier Hill Steel Co.

WILLIAM H. COLDWELL, president Coldwell Lawn Mower Co., Newburgh, N. Y., died suddenly at his home in that city Dec. 24, following a paralytic stroke, aged 55 years. He was educated in Newburgh and early in life became connected with the lawn mower company. He is survived by his wife, a daughter and a son in the service in France.

JOHN GIBSON HAZARD, Syracuse, N. Y., died at his home in that city Dec. 27. He was born at Peace Dale, R. I., Feb. 19, 1877, and at the time of his death was vice-president of the Semet-Solvay Co., assistant secretary of the Solvay Process Co., secretary of the By-Products Coke Co., secretary and treasurer of the Kentucky-Solvay Coke Co., president of the Pennsylvania-Solvay Coke Co., and president of the Ironton-Solvay Coke Co.

PHILIP GENSHIMER, assistant general manager and a director of the Metal & Thermit Corporation, 120 Broadway, New York, died suddenly on Dec. 26 at the Memorial Hospital, Newark, N. J., where he had undergone an operation. Mr. Gensheimer was born in Germany in 1879 and was educated at the University of Berlin. For the last 10 years he had made his home in the United States. He came here originally to supervise the construction and operation of the various plants of the Goldschmidt Detinning Co., now a part of the Metal & Thermit Corporation. His engineering ability was responsible in no small measure for the success of the enterprise. At the time of his death he was in full charge of all the plants operated by the company.

WILLIAM E. WILCOX, retired Pittsfield, Mass., manufacturer, died Dec. 25. Born at Taunton, Mass., in 1839, he became superintendent of the Pittsfield Tack Co. in 1876, and later organized the Berkshire Tack Co., of which he was treasurer and general manager.

ARTHUR J. SULLIVAN, director and sales manager, Stocker-Rumely-Wachs Co., machine-tool dealers, Chicago, died of pneumonia, Dec. 29, aged 30 years, after an illness of one week. He had been with the firm five years, working his way up from salesman. Mr. Sullivan was a man of exceptional ability, widely known in this territory and greatly liked. He left a wife.

MARTIN PATTISON, Superior, Wis., for many years a prominent figure in the iron mining industry of Minnesota and upper Michigan, died recently at his home in Superior at the age of 77 years.

Machinery Markets and News of the Works

TALK OF LOWER PRICES

Prospective Purchasers of Tools Expect Reductions

Machine-Tool Builders Say This Is Impossible and Are Guaranteeing Against Declines

Prospective purchasers of machine tools are withholding the placing of orders, evidently in the expectation that prices will be reduced. However, a number of machine-tool manufacturers have issued announcements guaranteeing prices for three or six months, and in at least one instance a manufacturer has guaranteed his prices against reductions within one year.

With the uncertainties which confront the machine-tool industry, there is nothing to excite enthusiasm, but a majority of manufacturers and their selling representatives are showing considerable optimism for the long pull ahead. They expect a period of quiet lasting for three to six months, but believe that eventually there will come a demand for tools which will equal, if not exceed, the normal years before the war.

Rumors as to reductions in prices are said by machine-tool manufacturers in the Cincinnati district to be without foundation. Present costs are too high to admit of reductions, some say, and there cannot be

any marked decrease in costs until materials now on hand are used up. Labor costs are higher than at any time in the history of the business.

A buyer from Cuba has placed orders in the Cincinnati district, said to total about \$50,000, and this has given some encouragement that other export business will follow in a fair volume as soon as shipping conditions become better suited for export trade.

In the Cleveland market, there have been a few small inquiries from automobile manufacturers. These are believed to be mainly "price feelers," some manufacturers stating that they may place orders if prices are satisfactory.

The Chicago market is very quiet, but the Chicago & Alton Railroad is inquiring for a few tools and there are also inquiries from gas engine and tractor interests.

The New York market is also quiet, but dealers in December did a fair business, the totals averaging fairly well with December, 1914.

Claims for compensation from the Government on war contracts are not being handled very expeditiously. If the Government could make speedier adjustments business might be resumed much sooner than will otherwise be the case. Many manufacturers are said to be badly crippled financially on account of the large sums due them from the Government, and cannot go ahead with the readjustment of their manufacturing operations until compensation has been awarded.

New York

NEW YORK, Jan. 7.

Consumers evidently are expecting reductions in prices of machine tools, but nothing definite along this line has yet developed. Some sellers are guaranteeing their customers against price reductions within three months. A few machine-tool manufacturers are reported to have agreed to guarantee customers against declines within six months. This guarantee is especially important to dealers who would not be inclined to put machines in stock if not properly protected against losses.

There are some inquiries, mostly for one or two tools, but in a considerable number of instances prospective buyers, after receiving quotations, have announced their intention of delaying purchases. Despite the general lack of activity, dealers have done a fair amount of business the past month in small orders. One dealer reports that his December business was equal to that done in December, 1914, and larger than the total for December, 1913.

Crane business has almost reached an irreducible minimum. Aside from the prospective purchases of the Navy Department for the Mare Island Navy Yard, California, bids for which were received Dec. 16, and the requirements of the Pennsylvania Railroad for its Juniata and Marietta locomotive shops there is no business in sight. While crane builders have not formally announced lower prices it is stated by their representatives that quotations now on any inquiries would be somewhat lower, possibly 10 per cent or more, as compared with war-time prices. Further reductions will, of course, depend upon steel price reductions and the labor situation.

Formal cancellation orders have been sent out by the Bethlehem Steel Co. against a fairly large list of tools bought in November for a gun shop at its Lehigh plant, Bethlehem, Pa. The list included large lathes, grinders, cold saws and other tools.

The Duplex Tractor Co., Troy, N. Y., has been incorporated by H. R. Moseley, W. Pratt and L. A. Robinson, with a capital stock of \$75,000.

The Aeroll Stove Burner Corporation, New York, has been incorporated with a capital of \$500,000 to manufacture stove and other burners. J. J. Wetmore, W. E. Slater and A. B. Edwards, 3415 Broadway, are the incorporators.

The Harder Mfg. Co., Cobleskill, N. Y., has been incor-

porated with a capital of \$350,000 to manufacture refrigerators, etc. F. H., E. S. and G. D. Ryder, Cobleskill, are the incorporators.

The Livingston Radiator Corporation, New York, has been incorporated with a capital of \$100,000 to manufacture radiators and heating equipment. A. H. Noble, C. C. Webster and D. H. Livingston, 30 Broad Street, are the incorporators.

The United Aircraft Engineering Corporation, New York, recently incorporated with a capital of \$100,000 to manufacture air planes, has increased its capital to \$200,000 to provide for proposed manufacturing operations. P. G. Giffin and A. Jones, 55 Liberty Street, head the company.

The Poughkeepsie Cutlery Works, Poughkeepsie, N. Y., is considering plans for an addition to its plant, four stories, 75 x 125 ft., estimated to cost \$50,000.

Fire, Jan. 1, destroyed three shops of the foundry department of Rathbone-Sard & Co., Albany, N. Y., manufacturer of stoves, ranges, etc., with loss reported at \$100,000.

The Richardson & Boynton Co., Dover, N. J., manufacturer of stoves, etc., has closed its works for an indefinite period. Prior to a resumption of operations, it will make improvements, including repairs to machinery, and it will also take its annual inventory. It has been giving employment to about 450 persons, recently granting an 8-hour day and 10 per cent increase to molders. William L. R. Lynd is superintendent.

The Bureau of Yards and Docks, Navy Department, Washington, has had plans prepared for extensions to the naval station at Lake Denmark, N. J., to cost about \$100,000.

The Interstate Bridge Forge & Mfg. Co., Passaic, N. J., has been incorporated with a capital of \$25,000 by John A. Rubino, East Orange, and Abram Apple, Passaic.

The Govenite Co., Point Pleasant, N. J., has been incorporated with a capital of \$125,000 by J. A. Hellings, R. M. Clayton and C. J. Messinger, Ocean Grove, to manufacture talking machines.

MacGovern & Co., 114 Liberty Street, New York, power machinery merchants, have awarded a contract to H. Wilhelm & Sons, 803 East Jersey Street, Elizabeth, N. J., for a one-story building, 50 x 150 ft., at Linden, N. J., to cost \$20,000.

The Standard Oil Co., 26 Broadway, New York, is planning the construction of a branch works at Seaman Street and Matano Place, Perth Amboy, N. J., at an estimated

cost of \$53,600. Fire, Jan. 2, at the Constable Hook, Bayonne, plant of the company destroyed part of the can and case department, located in a two-story brick building.

The Board of Chosen Freeholders, Jersey City, N. J., has had plans prepared for a new power plant, 100 x 185 ft., for county lighting service, to be located at Laurel Hill.

The Continental Can Co., Syracuse, N. Y., is said to be preparing plans for its proposed plant in the vicinity of Fifteenth Street, Jersey City, N. J., estimated to cost about \$200,000.

The Beacon Iron & Metal Co., 109 Belmont Avenue, Newark, N. J., has filed notice of organization to manufacture metal specialties. Abram Shampanier, 590 East 138th Street, New York, heads the company.

The Essex Machine Repairing Co., 46 Marshall Street, Newark, N. J., has taken out permit to build a one-story extension.

The Yankee Stove & Range Co., Newark, N. J., has been incorporated with a capital of \$25,000 by Meyer Koplan and H. J. Fesster.

The S. G. F. Tool & Die Co., 72 Berkshire Place, Irvington, N. J., has filed notice of organization. Richard Stevens, 751 South Eleventh Street, and Harry Gilling, 37 Brookdale Avenue, head the company.

The Abrasives & Metals Corporation, 325 Ferry Street, Newark, N. J., has purchased the property now occupied and recently leased from the Celluloid Piano Key Co., for a permanent manufacturing plant.

The Detroit Auto Radiator Co., 986 Springfield Avenue, Newark, N. J., has filed notice of organization to manufacture automobile radiators. Louis Dolinsky, 364 Littleton Avenue, heads the company.

The Ford Motor Co., Detroit, Mich., is pushing to completion for early occupancy its plant on the Passaic River, Kearny, N. J., and expects to commence active operations within the next few weeks. The plant for initial work will be given over to the assembling of automobiles, with the employment of about 1500 men. This number will be rapidly increased to several thousand until a point of maximum production is reached. It is understood that plans call for a total of 50,000 motor cars to be turned out by the plant during 1919. The company has a tract of 87 acres of land in this section. In addition to assembling operations, it is proposed to devote a portion of the works to the manufacture of parts at a later date. Gaston Plaintiff is Eastern manager.

The George W. Acherson Filter Co. has leased property at Green and Columbia streets, Newark, N. J., for a branch works.

The Roeder-Hall Co., 168 Summit Street, Newark, N. J., has filed notice of organization to operate a machine shop for auto repairs and general work. John G. Roeder and George L. Hall, 549 Clinton Avenue, head the company.

The Electric Lamp Products Co., 512 Paterson Plank Road, Jersey City, N. J., has increased its capital from \$40,000 to \$60,000.

The Peerless Tube Co., Bloomfield, N. J., has increased its capital from \$50,000 to \$200,000.

The Automotive Products Co., Jersey City, N. J., has been incorporated with a capital of \$600,000 to manufacture tools and other specialties. J. M. Smoot and W. C. Plummer, Detroit, Mich., and E. G. Dann, Cleveland, Ohio, are the incorporators.

The Bray-Pierson Co., New York, has been incorporated with a capital of \$10,000 by W. A. Werner, J. T. Abeles and W. T. Riley, 2 Rector Street, to manufacture machine and foundry equipment.

The Cary Spring Works, 240 West Twenty-ninth Street, New York, manufacturers of springs, etc., has been incorporated with a capital of \$50,000. Including in its lines of manufacture tools and machinery. P. S. Hill, F. R. and E. N. Cary are the incorporators.

The United Marine Construction Corporation, 15 Whitehall Street, New York, has increased its capital from \$200,000 to \$1,000,000.

The Long Island City branch of the White Co., Grand Concourse and 187th Street, New York, manufacturer of automobiles, will consist of a 1½-story reinforced-concrete building at Thompson and Nott avenues. The Watson Engineering Co., Hipp Building, Cleveland, is the architect.

The Johnson Graphite Lubricator Corporation, New York, has been incorporated with a capital of \$25,000 by W. B. Darling, 1131 President Street; F. A. Bunker, 518 West 145th Street, New York, and W. H. Bunker, 133 Harrison Avenue, Westfield, N. J.

The Tillmann Electro-Plating Works, New York, has been incorporated with a capital of \$25,000 by E. M. Tillmann, Dumont, N. J.; J. and E. Tillmann, 2074 Anthony Avenue, New York.

The Eschen-Oboler Iron Works, New York, has been organized, and it is understood will take over the iron works of L. S. Eschen, one of the incorporators, now at 941 Courtlandt Avenue. F. and B. Oboler, 814 East 167th Street, are also stockholders.

The Draeger Oxygen Apparatus Co., 309 Broadway, New York, has changed its name to the American Atmos Corporation.

The Coal Saver Corporation, New York, has been incorporated with a capital of \$6,500 by D. W. Riggis, G. P. Tobi and R. W. Thompson, 1730 Broadway, to manufacture special furnace equipment.

The Ulster Foundry Corporation, New York, has been incorporated with a capital of \$100,000 by A. A. Hebert, J. A. Warrie and E. H. Mays, 50 Church Street, New York.

Buffalo

BUFFALO, Jan. 6.

The Buffalo Dry Dock Co., Ganson Street, Buffalo, has filed plans for a one-story pipe-bending shop, 20 x 26 ft.

The American Radiator Co., 1807 Elmwood Avenue, Buffalo, has completed plans for two one-story additions, 38 x 100 and 30 x 60 ft.

The Worthington Pump & Machinery Corporation, 115 Broadway, New York, is reported to have arranged for the disposition of its Holly Pump Works at Lockport, N. Y. The plant consists of manufacturing and shop buildings located on about four acres of property.

The H. H. Franklin Mfg. Co., Syracuse, N. Y., is now manufacturing about 75 cars a week as compared with a normal output of about 200 cars per week. It is understood that it proposes to increase its manufacturing operations to this latter point of production at an early date.

The Planer Guard Co., Syracuse, N. Y., has been incorporated with a capital of \$50,000 by W. S. Lyon, O. Royal and C. E. Allen, Syracuse, to manufacture safety devices for machinery.

Many new industrial companies have been organized at Syracuse, N. Y., during the past year. The aggregate amount of capitalization of new incorporations is about \$4,000,000, and of which a large percentage was in machinery lines. Among the different companies organized were the Fuel Savings Heater Corporation, with capital of \$550,000; the Durston Gear Corporation, \$400,000; the Fancher Machine Co. and the Fancher Flexible Shaft Corporation, \$30,000; the Up-To-Date Harvester & Machine Co., \$100,000, and the Reals Brass Foundry, Inc., \$10,000.

Fire, Dec. 31, destroyed the talking machine works of the R. H. Kenyon Mfg. Co., Mexico, N. Y., with loss estimated at \$75,000. The plant will be rebuilt. John Weinstein heads the company.

Knowles & Peck, Rochester, N. Y., operating an iron and sheet-metal works at 50 Franklin Street, has filed plans for a one-story brick addition.

The T. H. Symington Co., Rochester, N. Y., is gradually reducing the working force at its munition works which have been devoted to Government production. The company has been giving employment to about 10,000 persons, with a payroll said to aggregate over \$300,000 weekly. It is understood that the remaining force will be reduced gradually, following the completion of current work for the War Department.

Hammond & Irving, Inc., Auburn, N. Y., has been incorporated with a capital of \$75,000 by C. S. Carr, R. M. Irving and C. M. Hammond, to manufacture steel and iron products.

The Cortland Cart & Carriage Co., Sidney, N. Y., manufacturer of carriages and parts, has increased its capital from \$225,000 to \$450,000.

A. R. Hinckley and associates, Oswego, N. Y., are negotiating for the purchase of the former drydock of the Globe Co. in this city. It is planned to build a drydock for ship repair work and organize a company to operate the plant.

The Harmon Machine Corporation, Watertown, N. Y., has been incorporated with a capital of \$50,000 by G. W. Tripp, A. H. Lefevre and C. W. Folts, 642 Bronson Street.

The Savage Arms Co., Utica, N. Y., is reducing its present working force preparatory to operating its local plant for the manufacture of sporting rifles and pistols. During the war the company gave employment to about 5000 persons, and about 3500 have been engaged at the plant up to the close of the year. The works have been shut down for a complete inventory, which is expected to require about three weeks. Operations will then be resumed on the manufacture of regular specialties, with employment of about 50 per cent of the present working force.

The Automatic Registering Machine Co., Jamestown, N. Y., is taking bids for two brick additions to its factory

42 x 42 ft., four stories, and 30 x 58 ft., two stories, at Jones and Gifford avenues. William J. Lansterer is manager.

The Harder Mfg. Corporation, Cobleskill, N. Y., has been incorporated with a capital stock of \$350,000 to manufacture agricultural machinery. E. S., F. H. and G. D. Ryder are the incorporators.

The Buffalo Marine Construction Corporation, Buffalo, has filed plans for the erection of two one-story additions to its plant on the outer harbor at the foot of Michigan Street.

The Seneca River Power Co., Baldwinsville, N. Y., has increased its capital stock from \$50,000 to \$100,000 to care for extensions and improvements to its plant.

New England

BOSTON, Jan. 6.

Stocktaking has very generally at the beginning of the year enabled everybody to catch their breath and size up the industrial situation. Cutting the production by enforcing a steady tapering off process of cancellations brought forward an appeal to Washington that the rate might be slackened in the interests of those affected by the reduction of work. However, the district chiefs have not been permitted to allow any increase in the amount of labor to be performed, and a steady shrinkage until April 1 on war operations is required to clean up. While many have been laid off in various plants, there were others, as the New England Westinghouse and the American Steel & Wire Co., unusually busy. Camp Devens has recalled many limited service men loaned to the industries, 600 going in a group from local brass plants at Waterbury, Conn., to be mustered out. In the same locality it is pointed out that one concern, the Waterbury Clock Co., gave up last year 1500 employees to the munitions factories, and that this indicates how some labor readjustments are probable. A case is cited at Camp Devens where a captain and his entire company undertook on demobilization a big construction job with the former commander as foreman of the gang.

Construction has begun on an addition to cost \$15,000 for the Providence Steel & Iron Co., Providence, R. I.

The new factory building, \$30,000, three stories, 46 x 109 ft., brick, for the Waterbury Buckle Co., Waterbury, Conn., will be refigured later on.

Bids have been received for a \$45,000 boiler house at the United States Naval Air Station, Chatham, Mass.

Plans are being made for a water power development of the Passumpsic River, St. Johnsbury, Vt., by the Twin State Gas & Electric Co., H. L. Olds, vice-president, 55 Congress Street, Boston, Mass.

Rudnick Brothers, Boston, Mass., are erecting a manufacturing building to cost \$45,000, two stories, 45 x 200 ft.

Improvements to the amount of \$60,000 are nearly completed at the plant of the Bryan-Marsh Electric Works, Central Falls, R. I.

Plans are in hand for a hydroelectric plant at Pockingham, Vt., Bellows Falls, for the Bellows Falls Power Co.

A two-story workshop, 40 x 70 ft., to cost \$10,000, is now under way for the Providence Coppersmithing Co., Providence, R. I.

Isaac Church, manufacturer of expansion bolts, South Norwalk, Conn., is retiring, and contemplates selling his plant and business.

Fire, Jan. 2, at the automobile and carriage repair works of D. E. McCann's Sons, 65 Preble Street, Portland, Me., destroyed a portion of the four-story building, with loss estimated at \$50,000.

The Lakes & Oceanic Barge & Transit Co., Auburn, Me., has been incorporated with a capital of \$100,000 to manufacture barges and vessels. J. A. Pulsifer, F. E. Ludden and Z. D. Abbott, Auburn, are the incorporators.

Philadelphia

PHILADELPHIA, Jan. 6.

The Dexter Metal Mfg. Co., Front and Arch streets, Philadelphia, manufacturer of steel lockers, is having plans prepared for a one-story brick addition, 30 x 300 ft.

Fire, Dec. 27, destroyed the electric power plant of the Consolidated Heat, Light & Power Co., Honesdale, Pa., with loss estimated at \$50,000.

Joseph S. Schlabon, Chester, Pa., is building a one-story machine shop, 25 x 35 ft. on Edgemont Avenue near Eleventh Street.

The Century Hoist Mfg. Co., Lock Haven, Pa., has been incorporated with a capital of \$50,000 by Fred D. Gearhart and associates.

The International Motor Car Co., Allentown, Pa., is plan-

ning to increase its production of motor trucks during the coming year. During 1918 it doubled its output. L. J. Holmes is general manager.

The Eastern Foundry & Machine Co., Philadelphia, has been incorporated in Delaware with capital of \$250,000 by F. R. Hansell and S. M. MacFarland.

The Tioga Steel & Iron Co., Fifty-second Street and Grays Avenue, Philadelphia, has acquired property, about 114 x 508 ft., adjoining its works at Grays Avenue and Fifty-first Street.

The Emergency Fleet Corporation, through Charles Piez, general director, has announced its intention of allowing the American International Shipbuilding Corporation to complete its contract for Government vessels before the question of taking over the yard as a Federal enterprise is considered. Up to the present time 12 vessels have been launched, the first double launching taking place on Jan. 1, when two 7500-ton cargo carriers left the ways. Three steel fabricated vessels have been completed at the yard.

The American Engineering Co., Aramingo Avenue and Cumberland Street, Philadelphia, manufacturer of castings, has filed plans for a one-story brick addition to its machine shop, 20 x 21 ft.

The Electric Furnace Construction Co., Finance Building, Philadelphia, has increased its capital from \$100,000 to \$300,000.

George Sachsenmaier & Co., 145 North Third Street, Philadelphia, electric dynamos, etc., having plans prepared for a one and four-story shop building, 17 x 105 ft., at 926 North Third Street. A portion of it will be used for offices.

The Sherritt & Stoer Co., Finance Building, Philadelphia, dealer in machine tools, has increased its capital from \$50,000 to \$100,000.

The Kesting-Kopp-Keyster Co., Philadelphia, has been incorporated with a capital of \$25,000 to succeed Kesting & Kopp, now operating a wire works at 813 Winter Street. Edward Kramer is one of the principal incorporators.

The Summerill Tubing Co., Norristown, Pa., has increased its capital from \$100,000 to \$250,000.

The Board of City Commissioners, Harrisburg, Pa., has approved an appropriation for a new forge and blacksmith shop for the Highway Department.

The Landis Engineering & Mfg. Co., Waynesboro, Pa., has increased its capital from \$20,000 to \$150,000.

The Atlas Portland Cement Co., Northampton, Pa., has inaugurated capacity operations at its No. 4 cement plant, and is understood to be planning for activities at its other mills on a like basis. The Coplay Cement Co., Coplay, has commenced work at its mill C at maximum output and is arranging for the continuance of such operation throughout the winter. Improvements are being made at mill B preparatory to full operation. The Lehigh Portland Cement Co., Allentown, is now operating its mill at Fogelsville and plant D at Ormrod.

The Pennsylvania Forge Co., Wakeling and Stiles streets, Philadelphia, manufacturer of iron and steel forgings, has increased its capital from \$300,000 to \$600,000.

The Reagan Grate Bar Co., 209 North Front Street, Philadelphia, manufacturer of grate bars, etc., has increased its capital from \$100,000 to \$150,000.

The Lehigh Car Wheel & Axle Works, Catasauqua, Pa., has increased its capital from \$300,000 to \$600,000. It has also arranged to increase its indebtedness to \$600,000, to be used, it is understood, for general expansion.

Baltimore

BALTIMORE, Jan. 6.

Industrial construction work in this vicinity appears to be considerably improved of late, due to the lifting of bans which had been placed because of the war. In addition to several announcements which have been made it is understood that many others will follow in the near future.

Morton McI. Dukehart & Co., 641 Light Street, Baltimore, has bought a site, 210 x 269 ft., on Key Highway and will build a plant for the manufacture of pumps and engines.

The Hess Steel Corporation, Biddle Street and Loney Lane, Baltimore, is reported planning for large extensions.

Thomas K. Barrett, 111 East Lafayette Avenue, Baltimore, will establish an automobile repair shop at 1201 Hunter Alley.

The District Commissioners, District Building, Washington, D. C., plan the erection of a forge at the workhouse, Occoquan, Va.

The Wheeling Machine & Welding Co., Wheeling, W. Va., has been organized and will install machine shop and welding equipment on which prices are sought. The company will conduct jobbing and contract machine work and deal

in machinery and supplies. W. J. Braddock is president, and E. W. Krause, manager.

The Southern Metal Culvert Co., Salisbury, N. C., has been organized. M. C. Quinn is general manager.

The Atlantic Paper & Pulp Corporation, Savannah, Ga., wants prices on 5 and 10-ton steel cranes with 35-ft. boom.

The Maryland Pressed Steel Co., Hagerstown, Md., is reported to have received from the Ordnance Department, Washington, an order of suspension on all its war contracts. It is said, however, many outside orders are being received. It also is reported the company plans to manufacture aluminum ware. The company is controlled by the Poole Engineering & Machine Co., Baltimore.

The Bethlehem Shipbuilding Corporation, Sparrows Point, Md., is building a one-story addition to its fabricating shop, 40 x 160 ft.; a one-story layout shop addition, 45 x 425 ft., and a one-story electrical shop extension, 75 x 150 ft.

One of the buildings of the Wilmington Steel Co., Wilmington, Del., was destroyed by fire Dec. 30.

The Baltimore Water & Electric Co., Baltimore, is considering the construction of a one-story electric pumping plant at Dickeyville, Md., to cost about \$15,000.

The Lumberton Fibre Co., Lumberton, N. C., recently organized, is planning a plant for the manufacture of fibre products. Electrically operated machinery will be installed. J. L. Stephens is president.

The Bureau of Yards and Docks, Navy Department, Washington, will build a one-story boiler plant, 92 x 115 ft., at Hampton Roads, Va., and an oxy-acetylene works at Charleston, S. C., to consist of main manufacturing plant to cost \$25,000, refrigerating plant to cost \$100,000, general service building, \$25,000, fuse works and other structures.

The new plant of the Norfolk Glass Mfg. Co., Virginia National Bank Building, Norfolk, Va., will consist of two main buildings, 60 x 200 ft., and two smaller structures, 25 x 50 ft. The installation will consist of glass manufacturing machinery, wood-working equipment for the manufacture of boxes and crates, with electric drive where possible, cranes, conveyor system and other apparatus. A. F. Cathey is president.

The Murray Co., manufacturer of cottonseed oil mill and cotton ginning machinery, Atlanta, Ga., will erect a new gray iron foundry, 72 x 200 ft. Lockwood, Greene & Co., engineers and architects, are the contractors. N. B. Henry is works manager.

The Fairfield Utilities Co., Fairfield, Ala., recently incorporated with a capital of \$50,000, is planning a local electric light and power plant. George G. Crawford, president, Tennessee Coal, Iron & Railroad Co., heads the company. L. T. Beecher, Birmingham, is secretary.

The city of Bradenton, Fla., will purchase a steam-driven air compressor, air-lift pump and two 11-hp. Westinghouse motors for operating a bridge.

William C. Hale, secretary, Alabama Canning Co., Birmingham, Ala., wants prices on 50-hp. boilers and 12-hp. engines.

The Manufacturers Selling Agency, Birmingham, Ala., is seeking prices on four heavy-duty shell-turning lathes, 30 in. x 14 ft. minimum.

R. W. Harrison, Meridian, Miss., wants prices on lathes and other machinery for the manufacture of box veneer.

The United States Fuel-Saving Equipment Corporation, Charlottesville, Va., has been incorporated with a capital of \$250,000 to manufacture stoves, etc. A. D. Dabney and W. A. Gibson are the incorporators.

The East Gulf Coal Co., Mount Hope, W. Va., is planning for the construction of two coal tipplers at its properties near East Gulf. Considerable equipment will be purchased for general operations. P. M. Snyder is president.

The Wheeling Electric Co., Wheeling, W. Va., is said to be planning for the construction of a new electric power plant to cost over \$750,000.

The Hancock Foundry Co., Inc., Hancock, Md., recently incorporated with a capital of \$25,000, will be known as the Hancock Foundry & Machine Co. The foundry acquired by the company at New Cumberland, W. Va., will be devoted to the production of castings, mine car parts and other specialties. H. B. Michener is manager.

The Southern Aluminum Mfg. Co., Asheville, N. C., is considering the establishment of new works near Greenville, S. C., to be operated as a branch plant for the manufacture of aluminum specialties.

The Hodges Boiler Works, Mobile, Ala., is planning for the rebuilding of part of its plant, recently destroyed by fire with loss reported at \$10,000.

The Guyan Machine Works, Logan, W. Va., wants prices on cold-rolled shafting and round iron up to 6 in. in diameter; angle iron up to 1 in. x 8 in. x 8 in.; 2 in. channel iron; milling machine, gear cutters, etc.

Chicago

CHICAGO, Jan. 6.

In point of actual sales, business in machine tools has been exceedingly quiet since Christmas, but the trade finds encouragement in a few inquiries, some of which are of fair size. The Chicago & Alton is inquiring for some medium and heavy tools, and there are other inquiries from the gas engine and tractor lines.

With all the uncertainties which confront the machine-tool industry, there is nothing to excite enthusiasm, but most representatives are keeping a stout heart, and the optimists have a little the best of it in numbers. Everyone is awaiting some announcement as to the precise manner in which the Government will dispose of the vast quantity of tools it purchased for munitions purposes. A more expeditious settling of compensation claims made by contractors on the Government is needed for the good-feeling of the industry. At present in a great number of cases either tool builders or the dealers representing them are "holding the umbrella" in that they have large sums tied up which they cannot recover until the Government compensates tool purchasers. Compensation is allowable wherever machines are 50 or more per cent completed.

As matters stand, the purchaser declares he desires to cancel. The dealer so states to the builder, and the latter responds that the machines in question are too far advanced to cancel. When this is reported to the purchaser he seeks Government advice, and is then instructed to accept delivery and put in his claim with the War Department. But until the purchaser gets the money he will not pay the dealer or the builder as the case may be.

A few lines of machines are not affected by the prevailing situation, a case in point being vertical boring mills, which have been scarce since the war started. One maker says that business has been so good since the signing of the armistice that his deliveries are further off than ever, some sizes not being obtainable until spring.

There has been a light movement in second-hand machinery, to effect which several dealers have cut their prices more or less. At least one dealer in used machinery is endeavoring to make a survey of the situation as it involves the Government, seeking to ascertain especially the extent to which different types of machines will be affected. There is no question as to the great number of engine lathes and turret machinery which will come, in one way or another, on the market, but not so much is known as to the number of other types. It may be stated that some dealers, if given an opportunity to purchase, intend to offer a low price per lb. to secure safety for themselves. In this connection it is emphasized that many of the tools which will be offered are now lacking in parts to make them complete, and considerable rehabilitation will be necessary before they can be called standard again.

The Ahlberg Bearing Co., 2636 South Michigan Avenue, Chicago, will build a two-story factory, 90 x 100 ft., in Twenty-ninth Street, between Calumet and Prairie avenues. It will be of mill construction and cost about \$25,000.

The Acme Steel Goods Co., 2324 Archer Avenue, Chicago, is adding another unit to its steel hoop mill at 134th Street and Indiana Avenue, the new work comprising a one-story boiler house, pump house and oil storage building, of reinforced concrete and brick, to cost \$30,000. The company has erected a one-story building, 85 x 170 ft., costing \$175,000. When completed the entire plant will represent an investment of about \$1,000,000.

The Ilg Electrical Ventilating Co., 147 Whiting Street, Chicago, has postponed the erection of the factory it has planned for Elston Avenue and Snow Street. It will cost, including the site, about \$750,000.

A contract has been let for the reconstruction of a three-story factory at 517 to 523 West Harrison Street, Chicago, for H. McFarlane & Co., wagon manufacturers. The building was damaged by fire.

Plans are being prepared for a two-story building, 50 x 90 ft., to be erected at Fourteenth Street and the Pennsylvania Railroad, Chicago, for that railroad, to house a small machine shop. Bids are being taken by E. R. Barry, division engineer, Union Station, Canal and Adams streets, Chicago. It is to cost \$40,000.

The W. F. Hall Printing Co., 466 West Superior Street, Chicago, which is to erect a seven-story printing building to cost \$800,000, is undecided as to when operations will be started.

The International Leather & Belting Co., 3239 and 3241 South Western Avenue, Chicago, will add to its recently completed plants two one and two-story units in the near future.

The Goldsmith Brothers Smelting & Refining Co., 29 East Madison Street, Chicago, contemplates the erection of additional buildings to its plant at 5844 Throop Street.

Ground has been broken for an addition to the plant of the Hoefer Mfg. Co., Freeport, Ill. The addition, together with the remodeling of the old plant, is being handled by Frank D. Chase, Inc., industrial engineer, Chicago. It is hoped by local interests that the work represents the advent of construction activity in Freeport, as nothing has been done there in the industrial line for several years.

The Air Reduction Sales Co., which has a plant at 113 Plum Street, St. Louis, has purchased a site at Venice, Ill., and it is announced that plans have been prepared for new buildings. The company is establishing plants throughout the United States for the manufacture of oxy-acetylene equipment and gas.

The Iowa Steel Post Co., Waterloo, Iowa, has been incorporated with a capital stock of \$250,000 by A. R. Slade, J. R. Bunyan and J. G. Clark, Waterloo. The company has selected a site and will start on a plant at an early date.

It is announced by W. A. Hance, president Stover Mfg. Co., Freeport, Ill., that the company will make additions and improvements to its plant at a cost of \$500,000 this year.

The American Motor & Mfg. Co., Stillwater, Minn., has been sold by its receiver, A. J. Holm, to the American Harvester Co., Minneapolis, for \$15,000. The new owners will dismantle and move the machinery.

The Electric Machinery Co., Fourteenth Avenue, N. E., Minneapolis, Minn., is planning for the erection of a four-story addition, 60 x 80 ft.

The Bradford Wrench Co., Chicago, has been incorporated in Delaware with capital of \$600,000 to manufacture tools, wrenches, etc. Victor Gardner, John S. Tripp and Charles J. Henderson, Chicago, are the incorporators.

Fire, Jan. 1, destroyed the plant of the American Milling Co., Peoria, Ill., with loss estimated at \$600,000.

The Victor Mfg. & Gasket Co., South Troy Avenue, Chicago, is having plans prepared for its new one and two-story plant, 200 x 600 ft., on Twelfth Street, to cost \$250,000.

The Montague Iron Works Corporation, Chicago, has been incorporated in Delaware, with capital of \$500,000 to manufacture iron and steel products. Charles J. Horn, Harry H. Phillips and Burrell J. Craner, Chicago, are the incorporators.

A portion of the works of the Rock Island Plow Co., Rock Island, Ill., including new core department, was destroyed by fire recently with loss estimated at \$20,000.

The International Leather & Belting Co., 565 Washington Boulevard, Chicago, is planning for the erection of a one and two-story plant on South Western Avenue.

B. Cullen, 5439 West Twelfth Street, Cicero, Ill., has commenced the erection of a one-story machine shop, 60 x 80 ft., at Thirteenth and Kilbourne streets, Chicago.

The Apex Appliance Co., 3223 West Thirtieth Street, Chicago, manufacturer of washing machines, will build a two-story addition, 60 x 80 ft., to cost \$25,000, adjoining the present plant.

The Thomas Elevator Co., West Monroe Street, Chicago, has had plans prepared for a one-story, top addition, 20 x 50 ft.

The Peter Bros. Mfg. Co., Algonquin, Ill., maker of laundry machines, has let a contract for a \$40,000 addition which will double the output of its plant. The extensions will be two stories, 53 x 177 ft. The company employs 100 men at present.

The Armstrong Brothers Tool Co., 335 North San Francisco Avenue, Chicago, is preparing plans for a one and two-story addition to be erected in the spring at a cost of \$65,000.

The Hoffman Brothers Motor Co., Omaha, Neb., has been incorporated in Delaware with capital of \$1,000,000 to manufacture automobiles. William L. Hoffman, Omaha; Ralph S. Wiltenet and Verne G. Cawley, Elkhart, Ind., are the incorporators.

Pittsburgh

PITTSBURGH, Jan. 6.

Fire, Dec. 28, partially destroyed the plant of the Joseph Reid Gas Engine Co., Oil City, Pa., manufacturer of gas and gasoline engines, with loss estimated at \$300,000.

The Keath Planing Mill Co., Lititz, Pa., has increased its capital from \$20,000 to \$30,000.

The Allegheny Steel Co., Pittsburgh, has acquired about six acres and several manufacturing buildings near Brackenridge, Harrison Township, for a consideration of about \$125,000. The new owner will equip the buildings for the manufacture of its specialties to replace the property in this same section recently sold by the company to the West Penn Power Co.

The Universal Safety Razor Co., Pittsburgh, a Delaware corporation, has increased its capital from \$250,000 to \$3,000,000.

Fire, Dec. 31, destroyed a portion of the wagon manufacturing plant of the Mayer Wagon Co., 6459-6463 Franks-town Avenue, Pittsburgh, with loss estimated at \$5,000.

The United States Welding Co., Pittsburgh, has been incorporated with a capital of \$5,000 by E. C. McHugh and associates, to manufacture welding equipment.

The Signal Truck & Tractor Co., Welch, W. Va., has been incorporated with a capital of \$25,000 to manufacture automobile trucks and parts. J. Logan Hill, W. W. and J. W. Whyte are the incorporators.

The Kanawha & Michigan Railroad, Charleston, W. Va., will soon commence the construction of a new engine house, with shop facilities. An 80 ft. turntable will be installed.

Milwaukee

MILWAUKEE, Jan. 6.

The first few days of the new year have developed a veritable flood of inquiries for machine tools. These, with a fair amount of new business actually placed, have given encouragement to the industry, which is inclined to hold out good hopes for an active trade. It is significant that from the time of the signing of the armistice local milling machine manufacturers have not reduced working forces by a single man and have maintained the regular night shifts through the holidays to meet delivery specifications. The January-February period in normal times is usually quiet, but the stream of inquiries being received gives promise of the development of some good business within that time. The automotive industry is the predominating source of inquiries, and requirements are developing in the passenger and commercial car, tractor and gas engine trades in this country and Europe.

The Townsend Mfg. Co., Janesville, Wis., manufacturer of gas and kerosene engines and tractors, has increased its capital stock from \$125,000 to \$175,000. The increase has no special significance, other than that it is made necessary by the expansion of the business and enlargement of facilities the past year. R. B. Townsend is general manager.

The Conradson Machine Tool Co., Green Bay, Wis., has been organized under the direction of C. A. Conradson, formerly of Eau Claire, Wis. Local capital has been interested in the company, which is being formed with an authorized capital of \$300,000 to manufacture lathes and other tools. Details of the project have not been given out.

The DePere Mfg. Co., DePere, Wis., which is affiliated with the Joliet Bridge & Iron Co., Joliet, Ill., and is executing a Government contract for marine boilers, will establish a department for the manufacture of conveying machinery and equipment. The project involves the consolidation of the Joliet company's conveying machinery shop at Chicago with the DePere works. Extensions will be erected in the spring, but specifications have not been completed. J. B. Freeman, Chicago, is chief engineer of the conveying machinery department. E. S. Clark is general manager of the DePere Mfg. Co.

The International Toy Co., Eau Claire, Wis., organized recently with a capital stock of \$100,000 and now operating in leased quarters, is preparing to erect a plant, 60 x 300 ft., with a separate transformer house and office building. It manufactures metal, rubber and wooden toys, sleds, etc. L. D. Fangborn is president and manager.

The Sterling Fixture Co., Milwaukee, has been incorporated with a capital stock of \$25,000 to manufacture electric light and power fixtures and to do a general electric contracting and engineering business. The promoters are represented by Henry H. Otjen of Otjen & Otjen, attorneys, 97 Wisconsin Street, Milwaukee.

The Madison-Kipp Lubricator Co., Madison, Wis., manufacturer of lubricating systems and devices for machine tools, motor vehicles, tractors and general machinery, has changed its corporate style to the Madison-Kipp Co. The officers are: President, Thomas Coleman; vice-president, Thomas E. Coleman; secretary, A. X. Merz; treasurer, W. H. Putnam.

The Milwaukee Forge & Machine Co., 340 Oklahoma Avenue, Milwaukee, has increased its capital stock from \$150,000 to \$250,000 to accommodate the growth of its business. It operates a large machine shop and forge works, which are being enlarged. The officers are: President George B. Pillar; vice-president and treasurer, John Eckert, secretary, Paul J. Ramstack.

The A. B. & B. Specialty Co., 3302 Fond du Lac Avenue, Milwaukee, manufacturer of automobile, truck and tractor accessories and specialties, has broken ground for a two-

story brick addition, 50 x 100 ft., estimated to cost about \$15,000. Charles Stolper is president and treasurer.

It is reported that the Ashland Light, Power & Railway Co., Ashland, Wis., is preparing to undertake early in the spring a hydroelectric power plant project on the Flambeau River, 14 miles north of Ladysmith, which is expected to cost about \$1,750,000 complete. The work is in charge of L. E. Myers & Co., 53 West Jackson Boulevard, Chicago.

The Manitowoc Plating Works, Manitowoc, Wis., is contemplating the erection of an addition costing about \$10,000, with equipment. Plans have not yet been prepared. W. J. Wachowitz is manager.

The Ranahan Iron Works, Milwaukee, has been incorporated with a capital stock of \$10,000 to build, equip and repair vessels, etc. The incorporators are John P. Ranahan, T. E. Leavy and Herbert R. Manger, attorney, Mack Block, Milwaukee.

The Milwaukee Bridge Co., Milwaukee, will build a "first-aid" building, 25 x 30 ft., at its structural shop, 1400 Thirty-fourth Street.

The Kaukauna Machine Co., Kaukauna, Wis., manufacturing power hammers and doing a general machine shop and foundry business, has increased its capital stock from \$50,000 to \$100,000. L. C. Mayer is chief engineer.

The Multitone Mfg. Co., Eau Claire, Wis., which is manufacturing talking machines and other musical instruments in leased quarters, contemplates the erection of a plant in the coming spring. E. J. Sailstadt is president and manager.

The Acme Pattern Works, Milwaukee, has been incorporated with a capital stock of \$20,000 to manufacture metal and wood patterns for the foundry trade. John F. Schnauffer, 525 Washington Street, is president and manager of the company.

The Lake Side Craft Shop, Sheboygan, Wis., manufacturer of metal and wood art goods, will erect a two-story brick-veneered factory addition, 70 x 100 ft., at South Twelfth and Kentucky Avenue.

The Aluminum Goods Mfg. Co., Manitowoc, Wis., has purchased two lots, 60 x 300 ft., adjacent to its works at Two Rivers, Wis., as a site for future extensions. Plans will be prepared within a short time. George Vits is general manager.

Fred R. Slater, Superior, Wis., has plans for a small addition to his foundry at 1001 Winter Street.

Detroit

DETROIT, Jan. 6.

The machine, tool and general shop equipment industry which has made little progress the last month, is expected to be well on the upgrade by Feb. 1, according to many local dealers, distributors and manufacturers' representatives. An official of one company states: "Business is good and we are getting plenty of inquiries, but from our observations it will be only after Feb. 1 that any considerable increase in trade may be expected. There are plenty of prospective buyers, but they are waiting just a little while longer until the readjustment period has made more progress, and until the various retrenchment orders and other wartime rules and regulations have been lifted. The general outlook was never better."

The Riverside Machinery Depot, St. Aubin Avenue, has been receiving many inquiries for equipment. Business has been good, but the prospects are that within another month or two the demand will approach the unprecedented. Many new concerns are starting in business and many existing firms are increasing their production capacity.

The White Mill property, near Adrian, Mich., has been deeded by the city of Adrian to Henry Ford and Clara Ford, his wife, and will be the site for the tractor plant to be erected by Henry Ford & Son. According to S. W. Raymond of the Ford interests, the Adrian plant will at first be used for the manufacture of certain parts for the Ford tractor. Construction will start in the spring.

The Liberty Machine Corporation, Detroit, has been organized with a capital stock of \$100,000, half of which has been paid in property. The incorporators are J. William Barnes, broker; Norman O. Fraser and Clifford R. Cook, vice-president, the Mileometer Co., and vice-president, the Palmer-Paul Co.

The addition, 160 x 280 ft., to the Industrial Works, Bay City, Mich., is nearing completion. The company has shifted to peace conditions with no diminution of the working force.

At a recent mortgage sale, Mrs. Lillian Cleaves Byers, owner of the Portage Lake Foundry & Machine Co., Portage Lake, Mich., purchased the Hodge Iron Works, Ripley, Mich., which was organized 45 years ago by S. F. Hodge, Detroit.

a pioneer iron founder, who conducted the business under the name of S. F. Hodge & Sons.

The Aspinwall Mfg. Co., Jackson, Mich., has received export orders from Siam, Honolulu, France and Norway, and specifications for other machinery are expected from India and England. Potato planters and diggers are the products of the company.

The Edmunds & Jones Corporation, Detroit, manufacturer of automobile lamps and spotlights, has plans under way for the erection of an addition to cost about \$35,000.

The plant of the Monroe Motor Co., Pontiac, Mich., will be sold at a receiver's sale Jan. 25. It comprises about 100,000 sq. ft. of manufacturing space, heretofore devoted to automobile manufacture.

Lewis T. Kline, Alpena, Mich., manufacturer of lathes, baling presses, etc., is in the market for a building for foundry use. Specifications desired call for a steel frame building 240 to 260 ft. long with craneway for 5-ton traveling crane, 40-ft. span from center to center of rail on either side and with 6 in. clearance at each end of crane beam, from center of rail to frame of building; 16 ft. from ground to top of rail, and 4 ft. clearance from top of rail to roof truss. Roof to have center ridge running whole length of building, 1 to 2-ft. pitch from center to eaves on both sides. Frames to be spaced 20-ft. centers.

The Jackson-Church-Wilcox Co., Saginaw, Mich., is building an addition to care for construction of machinery and boilers.

The Fort Wayne Corrugated Paper Co., Fort Wayne, Ind., is considering the erection of a two-story addition to its works at Hartford City, to cost about \$75,000.

The Flower Stephens Mfg. Co., Clayton and Parkinson avenues, Detroit, is taking bids for the construction of a one-story addition to its foundry, 37 x 150 ft., to cost \$18,000.

The Edmund & Jones Co., 436 Lawton Avenue, Detroit, manufacturer of acetylene generators, etc., has awarded a contract to E. F. Lang, Hammond Building, for the construction of a one-story top addition to cost \$45,000.

Carl E. Schmidt & Co., 48 Macomb Street, Detroit, is taking bids for the erection of a one-story addition to their plant at the foot of Lieb Street, 20 x 270 ft., to cost \$15,000.

Cleveland

CLEVELAND, Jan. 6.

The local machinery market continues dull and orders are confined almost wholly to single machines. The Chandler Motor Car Co. is inquiring for about half a dozen machine tools, and a few other inquiries have come out for lots of 3 to 4. Many of these are price feelers, some manufacturers stating that they might place orders for additional equipment should prices prove satisfactory. Several machine tool manufacturers have issued announcements guaranteeing prices for periods ranging from three to six months, and at least one for a full year. It is believed that these guarantees may have some effect in stimulating business from companies not inclined to place orders now because they look for early price reductions.

A leading automobile interest has purchased considerable equipment for the manufacture of farm tractors on a large scale. The Cleveland-Osborn Mfg. Co. has taken orders for 46 molding machines for making tractor castings for this interest, 39 for gray iron castings, and 7 for malleable work. It has also taken an order for 12 machines for a New York foundry for making gasoline pump castings.

The Hydraulic Press Mfg. Co., Mount Gilead, Ohio, which has been largely engaged on Government work for some time, is planning to make some extensions to its present line and modifications that will apply to new fields. Among these are hydraulic truck tire applying presses and hydraulic seed oil presses. While the company recently increased its output, which was stimulated by direct and indirect ordnance contracts, its change of products from regular lines to war work did not involve radical changes in production or methods of manufacture and it has not been greatly inconvenienced by the discontinuance of war orders. It has been building hydraulic presses for various operations in making steel shells, powder presses, die presses and hydraulic valves and fittings for the Government, and is planning to extend its business in the domestic and foreign markets. The plant is well equipped for present needs and the only enlargement contemplated is an extension to its office building.

The Defiance Machine Works, Defiance, Ohio, which added a large amount of new equipment for war work, which can be used for the manufacture of its regular line of machinery, is planning to increase its output over the pre-war period by at least 100 per cent. In addition to extending its present line of special wood-working machines and

machine tools it contemplates bringing out a line of special production machine tools. Besides manufacturing its regular line of equipment for the Government it has been engaged in making 3-in. anti-aircraft guns. Further extensions to the plant and the installation of additional equipment are planned. The company reports that it has always had a large foreign trade which it is now endeavoring to increase.

The Roland-Price Steel & Iron Co., Cambridge, Ohio, has been incorporated with a capital stock of \$50,000 and contemplates erecting a plant. A 15-acre site has been acquired and it is stated that as soon as the plant is built the company will engage in the manufacture of parts for steam shovels and mining cars, but that later steam shovels will be manufactured.

Cancellations of Government contracts in Erie, Pa., resulted in the discharge of over 1200 men a few days ago, many of whom were from the plant of the American Brake Shoe & Foundry Co.

The Roberts-Wright Co., 622-624 Swetland Building, Cleveland, has been formed to engage in construction and production engineering. The officers are: President, P. H. Withington; vice-president, A. E. Roberts; secretary, G. Otis Wright, and treasurer, J. E. Roberts, all of whom were connected with the Burchard-Roberts-Wales Co., which has been engaged in a similar line.

The Akron Brass Mfg. Co., Akron, Ohio, has been incorporated with a capital stock of \$50,000 by T. H. Dillon, C. R. Pittjohn and others and will equip a plant, 60 x 160 ft., for the manufacture of hose couplings and nozzles. There is a heavy demand for these products from Akron rubber manufacturers, but at present it is supplied by makers outside of the city. Some of the men interested in the new company are associated with Akron rubber companies.

The Sandusky Foundry & Machine Co., Sandusky, Ohio, in order to take care of the increased demand for its products during the war added to its foundry capacity a new building in which is located its increased melting equipment and special casting machines in which bronze tubes up to 30 in. in diameter and 20 ft. in length are made. To bring the machine shop capacity up to the foundry output additional machinery was installed for turning and boring these tubular shapes. The company reports that while the demand for bronze tubing for ordnance work and for auxiliary machinery has fallen off, there has so far been no curtailment in the demand for tubing used in the shipbuilding industry.

The Allerding Products Co., Mansfield, Ohio, has been incorporated with a capital stock of \$50,000 to manufacture steering wheels and other wooden parts for automobiles, tractors, motor boats, airplanes, etc. It has acquired 10,000 sq. ft. of floor space and expects to place the plant in operation shortly. C. N. Allerding is president, Charles S. Monson, vice-president, and E. S. Walter, secretary and treasurer. Mr. Allerding recently was superintendent of the Humphreys Mfg. Co., Mansfield.

The Defiance Screw Machine Products Co., Defiance, Ohio, has moved into a new two-story brick, steel and concrete office building. It has also completed a three-story addition in which new machinery is being installed.

Cincinnati

CINCINNATI, Jan. 6.

Rumors as to reductions in machine-tool prices are said by leading makers to be without foundation. It is pointed out that material on hand was bought at the peak of quotations, while labor costs are higher than at any time in the history of the business. These conditions seem to preclude any chance for reductions until some unlooked for changes in production costs occur.

Optimistic reports for the immediate future are by no means general, but there are a few bright spots. A buyer from Cuba is said to have placed orders for machine tools with makers in this territory that will total nearly \$50,000. A local firm has recently received a good-sized order from a British company, and it is rumored that most of these machines are intended for shipment to Belgium. The inquiry from the Pacific Coast is more encouraging, but comparatively few orders have been received lately from that section. A number of plants took advantage of the holiday season to close down for general renovating. There is an over-supply of common labor, but so far manufacturers have been able to keep their skilled men on the payrolls. A steady reduction in the employment of women in machine shops has been made and only a few are now engaged. Definite information as to the plan of the Government in disposing of machine tools bought for war work would do a great deal to clarify the situation.

In the past year the following local manufacturing firms

either built new plants or made additions, all of which are now occupied: Cincinnati Bickford Tool Co., Cincinnati Planer Co., Cincinnati Milling Machine Co., Zering Mfg. Co., A. V. Carroll Machine Tool Co., R. K. LeBlond Machine Tool Co., Lodge & Shipley Machine Tool Co., Cincinnati Grinder Co., General Briquetting Co., Cincinnati Electrical Tool Co., Greaves Machine Tool Co., Champion Tool Works Co., Cincinnati Shaper Co., Steptoe Shaper Co., Cincinnati Grinder Co., Peerless Foundry Co., Cisco Machine Tool Co. and the Central Frog & Switch Co.

The Central Frog & Switch Co., Cincinnati, has in full operation its plant in Hyde Park and expects to add some machine tools within the next four or five months. The company makes a specialty of frogs, switches and crossings for industrial companies.

R. A. Jones & Co., Covington, Ky., makers of soap-pressing machinery, will add some equipment to their plant at an early date. Small lathes, planing machines and other equipment will be required.

The H. Zering Mfg. Co., Cincinnati, has removed its plant from Reading Road to a factory in Oakley. It manufactures warehouse trucks and trailers and will later add to its equipment.

The Cincinnati Specialty Mfg. Co., Cincinnati, has increased its capital stock from \$35,000 to \$50,000, and will increase the capacity of its plant at an early date. It manufactures automatic swivel lamp attachments for use in machine shops. The company is in the market for a slow acting press for straightening 9-in. plates.

The Long & Alstatter Co., Hamilton, Ohio, has increased its capital stock from \$200,000 to \$800,000 to take care of the company's enlarged business. A new foundry is now in course of construction adjoining its plant on High Street. F. C. Avery is general manager.

The H. G. Weeks Mfg. Co., Hamilton, Ohio, maker of sterilizing outfitts for soda fountains, has acquired the plant of the Buckeye Marble Co. on Millville Avenue. It will establish its own plating department.

The Erie Railroad Co. has commenced work on a large roundhouse, machine shop and other buildings at Dayton, Ohio.

The Allerding Products Co., Mansfield, Ohio, has been incorporated with \$50,000 capital stock, and will succeed the Allerding Motor Parts Co., whose organization was recently noted. The company will specialize primarily in the manufacture of steering wheels and wood rims used on automobiles, tractors, etc. Later it is planned to manufacture steering posts and other specialties. The company will be in the market for both wood and metal-working machinery. C. N. Allerding is president.

The Leidecker Tool Co., Marietta, Ohio, is removing its plant from its present location on Second Street to Westview suburb. Its capacity will be greatly increased when the new plant is in full operation.

The talking machine manufacturing building at the plant of the Knight-Brinkerhoff Piano Co., Brazil, Ind., was destroyed by fire Dec. 27, with loss estimated at \$40,000.

The Central South

LOUISVILLE, Jan. 6.

The demand for pumps and other oil well equipment is holding up extremely well, as the mild weather has resulted in continued operations in the eastern and western Kentucky fields. The Cumberland Pipe Line Co., Winchester, Ky., has been buying freely for extensions to its lines; the Indian Refining Co. is planning an additional 4-in. pipe line from the Allen County field in western Kentucky to Bowling Green, and several oil companies are equipping refineries in other sections of the State.

The Bridgeford Mfg. Co., 2021 Portland Avenue, Louisville, stove and range manufacturer, states it is in no way connected with the Bridgeford Co., which is in process of liquidation.

Amended articles of incorporation have been filed by the Republic Vulcanizing & Welding Co., Louisville, changing its name to the Republic Auto Parts & Welding Co.

A building permit has been issued to the Louisville Steel & Iron Co., for frame additions to its plant at Jones and N streets, replacing a section burned a few weeks ago.

With a capital of \$50,000, the Perfection Combustion Burner & Mixer Co., Louisville, has been established to manufacture gas appliances. F. W. Gault, Bruce Haldeman and others are interested.

The Greenville Stone & Gravel Co., Memphis, Tenn., wants prices on steel frame dump cars, standard gage, with 4 to 6 yard side dump.

The Henry Vogt Machine Co., Louisville, has increased its capital from \$1,000,000 to \$1,500,000 to take care of shop improvements and enlargements.

The American Pipe Line Co., Bowling Green, Ky., is planning to double the capacity of its pipe line into the western Kentucky oil fields.

The Whitesburg Coal Co., Whitco, Ky., J. Henry Hall, manager, is in the market for a 150-kw. power plant, complete, 250 volt, direct current.

The Lick Creek Coal Co., Willard, Ky., will install air compressor equipment and coal punching machines.

B. F. Avery & Sons, Louisville, will erect two additional buildings, enlarge the forging shops and other departments and increase the force about one-third as a result of having purchased from the International Harvester Co. the entire Champion line of harvesting machinery, patents, good will, etc., which it will transfer from Springfield, Ohio, to Louisville as soon as the necessary buildings can be erected.

The Casey-Hedges Boiler Co., Chattanooga, Tenn., is planning for the erection of an addition to its plant, to cost about \$20,000.

Fire at the pencil manufacturing plant of the Gulf Cedar Co., Nashville, Tenn., destroyed a portion of the works with loss, including equipment, estimated at \$50,000.

The St. Bernard Mining Co., Madisonville, Ky., is planning for the construction of a new electric power plant at Loch Mary.

The Universal Machine Co., Lehmann Avenue, Bowling Green, Ky., is considering the rebuilding of its plant destroyed recently by fire with loss of about \$10,000.

Fire, Dec. 29, destroyed the electric power plant of the Bristol Gas & Electric Co., Bristol, Va.-Tenn. It is understood that it will be immediately rebuilt.

T. P. Kendall and associates, Memphis, Tenn., are planning for the erection of a local plant for the manufacture of lumber tractors. The Chamber of Commerce is interested in the project.

St. Louis

ST. LOUIS, Jan. 6.

The Pascagoula Street Railway & Power Co., Pascagoula, Miss., is preparing to build a power plant.

The city of Macon, Mo., will install an additional 450 kva. generating unit. Frank L. Wilcox, Syndicate Trust Building, St. Louis, is the engineer.

The Okmulgee Ice & Light Co., Okmulgee, Okla., will increase the capacity of its plant, installing a 1250-kva. turbine generator, two 400-hp. boilers and other machinery.

The Monarch Machine & Mfg. Co., St. Louis, has been organized with a capital stock of \$5000 by Gus P. and Lawrence Mattman and John Wheeler, and is in the market for machinery.

The Terminal Refining Co., Cushing, Okla., has increased its capital by \$400,000, and will enlarge the capacity of its plant.

The city of Muskogee, Okla., will expend \$200,000 improving its waterworks plant and will add new pumping station equipment.

The Blackburn Patent Steering Wheel Co., St. Louis, has been incorporated with a capital of \$60,000. Jasper Blackburn, Webster Groves, Mo., and Buel P. Alexander, Bedford, Mo., are the incorporators.

A one-story boiler plant, 42 x 70 ft., will be erected by the American Packing Co., St. Louis, at its works on Garfield Avenue.

The Advance Electric Co., St. Louis, has been incorporated with a capital of \$50,000 to manufacture electrical apparatus. A. L. Canavan, Edward Bretch and D. J. O'Keefe are the incorporators.

The Inland Machine Co., North Broadway, St. Louis, is arranging for the erection of a two-story and basement addition to its plant in the spring, estimated to cost about \$150,000.

The Union Electric Light & Power Co., St. Louis, is planning for extensions and improvements in its boiler plant on Lewis Place to cost about \$150,000.

The Motor Products Corporation, 3951-3953 Locust Street, St. Louis, has equipped a plant for the manufacture of piston rings, and later will make other automobile accessories. The company was recently incorporated with a capital stock of \$200,000. S. Kauffman is president.

The Producers & Consumers Coal Co., Miami, Okla., capital stock \$150,000, John R. Cavanagh, president, is in the market for cars, boilers, hoisting equipment and mining machinery.

C. M. Huber, Crystal Springs, Miss., has acquired a plant which he will improve and enlarge for compressing cotton, pressing cotton oil, etc., and is in the market for machinery.

The Little Rock Railway & Electric Co., Little Rock, Ark., C. J. Griffith, general manager, will install an additional 5000 kw. turbine in its power house.

The Advance Electric Co., St. Louis, capital \$50,000, Edward Bretch, A. L. Canavan and D. J. O'Keefe interested, will equip a plant for the manufacture of electrical machinery.

The Magnus Metal Co., 4153 Clayton Avenue, St. Louis, will remodel its plant and add new machinery.

The Kant Break Spark Plug Co., St. Louis, J. M. McKittrick, D. M. Hutchinson and others interested, will equip a \$30,000 plant for the manufacture of spark plugs.

Texas

AUSTIN, Jan. 4.

An extraordinary demand for oil well equipment is reported from central western Texas. An indication of the magnitude of this trade, it is stated that on one day recently there was a congestion of three hundred cars of well-drilling machinery on the side-tracks at Ranger awaiting unloading.

A. L. Lambeth, president, United States Board of Inventions, and associates will build a factory at Wichita Falls for the manufacture of a device for recovering lost oil well tools. D. H. Warner, Dallas, is manager.

The Sun Oil Co., subsidiary of the Standard Oil Co., will build another refinery on a tract of 800 acres which it recently purchased near Beaumont.

The Prairie Pipe Line Co., Independence, Kan., which recently abandoned the project of laying a 12-in. oil pipe line from Ranger to Galveston by orders from the Government, announces that it will lay another 10-in. pipe line between Ranger and Cushing, Okla., in addition to the one it recently finished.

The Olds-Clark Refining Co. has plans for an oil refinery near Eastland, to have a daily capacity of 1500 bbl. Thomas Olds, Wichita, Kan., is at the head of the company.

The Empire Pipe Line Co., subsidiary of the Cities Service Co., owned by Henry L. Doherty & Co., New York, has under consideration the construction of a pipe line from the central western Texas fields to Fort Worth, thence to Gainesville, where the Empire Oil Gas Co., another subsidiary, operates a 15,000-bbl. refinery.

The Rio Grande Public Service Corporation, McAllen, will install new equipment at its electric light and waterworks plant which will more than double its capacity. It will also equip an ice plant. R. F. McCord is general manager.

The Abilene Oil & Refining Co., Abilene, which has been incorporated with a capital stock of \$250,000, will proceed immediately with its plans for constructing a refinery with a daily capacity of 1000 bbl.

The Transcontinental Oil Co., Tampico, Mexico, will build a machine shop at its Las Matillas terminals. Among the equipment will be a 5-ton traveling crane and a large turning lathe. The company has plans for two other shops, one at Panuco and the other near Tuxpan.

The Southern Shipbuilding & Dry Dock Co., Orange, will construct the 16 wooden ships which it had contracted to build for the Government, according to the original plans. This contract was canceled, but has been revived and given official approval.

It is announced that the Ryan Harbor & Dock Co. of Aransas Pass, in conjunction with the Tex-Mex Pipe Line & Refining Co. will build an oil refinery at Aransas Pass, construct pipe line and ocean terminal facilities and make other improvements at that port at a cost of approximately \$15,000,000. The construction of a pipe line from the Ranger field to Aransas Pass is also reported to be under consideration.

The Japanese Cotton Trading Co., Fort Worth, has purchased land at Galveston upon which it will erect a cotton compress and warehouse at a cost of about \$400,000. R. A. Hardin and M. Kobayashi are interested in the company.

The works of the Sullivan Machinery Co., Brownwood, Tex., was destroyed by fire recently with loss reported at \$50,000. The plant of the Brownwood Foundry & Machine Co. was also damaged to the extent of about \$10,000.

The Sterling Oil & Refining Co., Fort Worth, has plans for an oil refinery which it will construct, with a daily capacity of 5000 bbl. of oil. William McGinley is president.

The National Supply Co., Fort Worth, is arranging to build a plant for the manufacture of oil field supplies. It will represent an investment of about \$125,000.

The oil refinery which the Texas & Pacific Coal & Oil Co., Thurber, plans to construct will be one of the largest plants in the State. Several million dollars will be invested in the buildings and pipe line system.

The Constantin Refining Co., which is developing a property in the Burk Burnett field, is preparing to build a refinery at Duval, across the Red River from the oil field. The proposed plant will have an initial daily capacity of 5000 bbl. of oil.

California

SAN FRANCISCO, Jan. 2.

Optimism prevails among machinery houses and representatives of Eastern manufacturers. While there is some hesitancy in buying among heavy purchasers of machine tools a lively inquiry is noted for single machines, which in the aggregate amounts to a considerable volume. The reasons given for this hesitancy are the labor situation and a feeling that a readjustment of prices may follow with an open market in steel and iron.

With the release of the shipbuilding plants for private work, it is expected that some yards will be in the market for additional machinery. The Moore Shipbuilding Co., Oakland, is negotiating for a number of machines and the Union Construction Co., Oakland, is contemplating the erection of a plant to build marine engines. It is reported that if the company secures the contract which it is seeking it will at once come into the market for about \$50,000 worth of machine tools.

The United States Railroad Administration for the Central Pacific Co. has taken out permits for the erection on the Southern Pacific shop site of a one-story corrugated iron steel foundry to cost \$45,000, and a steel and concrete car repair shop to cost \$29,900.

The American Machine Works, Oakland, is contemplating the erection of a plant to cost, it is reported, several hundred thousand dollars. The company has just purchased a tract comprising a little more than five acres in Oakland, and plans are under way for the construction of the plant.

The Motor Transportation Corps, which has charge of all the wheeled vehicles in the Army, is contemplating the erection in San Francisco of a repair plant similar to those in the East and South, to cost between \$750,000 and \$1,000,000. The main building, the shop, will be 500 ft. sq., and there will be three warehouses each 160 x 300 ft.

The Doak Tractor Co., San Francisco, is planning to establish a factory at Napa, Cal., to build tractors.

The City Council, Los Angeles, has approved a bond issue of \$4,500,000, for improvements at the city harbor, San Pedro and vicinity, which will include the installation of cranes and other machinery for hoisting, loading and unloading materials; grain elevators, etc. The Harbor Department will be in charge of the work.

The Cosmopolitan Machine Works, 620 South Olive Street, Los Angeles, has been organized to manufacture machinery and parts. J. W. Shaw, 1149 Madison Avenue, heads the company.

The Sheet Metal Tools & Machinery Co., Los Angeles, has been organized and will locate at 1911 West Seventh Street. G. M. Kennedy, 710 South Alvarado Street, heads the company.

The Board of Education, Santa Barbara, has completed plans for the construction of a new machine shop for its manual training school.

The Waterford Irrigation District, Modesto, Cal., is planning for the construction of an electrically operated pumping plant in the vicinity of the Tuolumne River, near Waterford, to cost, with proposed irrigation system, about \$50,000. E. N. Bryan is chief engineer.

The Palmdale Irrigation District, Palmdale, is planning for the construction of a series of electrically-operated pumping plants in the Antelope Valley section, to cost about \$50,000.

The American Enameling & Stamping Co., Los Angeles, has been incorporated with a capital of \$50,000 to manufacture metal products. M. L. Houseman, Lucian J. Clarke and C. E. Smoot, Los Angeles, are the incorporators.

In connection with the new municipal sewerage system, the Board of Trustees, Newport Beach, Cal., will build an electrically operated pumping plant. The entire work will cost about \$173,000.

The Hall-Scott Motor Works, Berkeley, has awarded a contract for the construction of a reinforced concrete shop building to cost \$8,000.

The Union Construction Co., Oakland, has three steel vessels under construction and a fourth keel is about to

be laid. The company announces that it is prepared to bid for the construction of ships for all maritime countries as soon as present contracts with the Government permit.

Canada

TORONTO, Jan. 6.

Up to the end of November Canadian shipbuilders had built for Canadian registry during the war 199 sailing vessels of 44,135 gross tons and 160 steel ships of 69,612 gross tons. For the Imperial Munitions Board 15 ships of 1440 net tons each and 7 of 2600 net tons were built. The Dominion Government is having 40 steel ships built under contract, aggregating 255,250 tons. Two of these have been launched. The total capacity of Canadian yards is 460,000 tons per year.

The Mullen Construction Co., Pittsburgh, Pa., is taking over the drydock and shipyards at Prince Rupert, B. C., to carry out a steel shipbuilding contract for the Dominion Government. It is understood that it is also the intention to build wooden ships. The company proposes to spend at least \$500,000 on improvements, including extra equipment and the erection of plate, angle and assembling shops.

The Thomas Pink Co., Alexander Street, Pembroke, Ont., machinist and tool manufacturer, will make improvements to its factory at North Devon, N. B., to cost \$7,000.

The Flexible Metallic Packing Co., Adrian, Mich., contemplates the erection of a factory on McDougal Avenue, Windsor, Ont., to cost \$80,000. W. A. Leitch, 269 Victoria Road, is local superintendent.

Contracts have been awarded for a \$70,000 addition to the plant of the Canadian Steel Foundries, 120 St. James Street, Montreal.

The steel and wire factory owned by the Morrison Steel & Wire Co., Hawkes Street, Vancouver, B. C., was destroyed by fire with a loss of \$100,000. Plans will be prepared at once for the erection of a new plant, for which machinery will be purchased.

Price Brothers & Co., 56 St. Peter Street, Quebec, propose to erect pulp mills at Chicoutimi, Que., at a cost of \$1,000,000. Sir William Price, 145 Grand Allee, Quebec, is president.

The North American Bent Chair Co., Ltd., Owen Sound, Ont., is in the market for a number of electric motors.

The Dalyte Electric, Ltd., Guelph, Ont., has been incorporated with a capital stock of \$1,000,000 by Leo W. Goetz, John Sutherland, Jr., Helen McTague and others. It will take over the business of the Dalyte Lamp Co., Ltd., and the Flexible Conduit Co., and will manufacture conduits, cables, tungsten lamps, electrical equipment, etc.

It is reported that the Canada Carriage Factories, Ltd., will not rebuild its plant at Brockville, Ont., recently destroyed by fire with a loss of \$500,000.

S. L. B. Lines, 243 College Street, Toronto, is in the market for 37 in. foot-power squaring shears.

The National Shipbuilding Co., Goderich, Ont., is in the market for a 6-ft. radial drill; lathe, 12 ft. between centres; air hoist, 10-in. cylinder; 4-ft. lift with trolley; vertical air receiver, 44-in. inside diameter, 14-ft. high.

The New Westminster Co-operative Association, New Westminster, B. C., will build a cold storage plant at a cost of \$70,000.

The Empire Drydock & Contracting Co., Prince Rupert, B. C., plans the erection of a car ferry shops at an early date.

The Pacific Great Eastern Railway, Vancouver, B. C., contemplates developing electric power along its lines in British Columbia. George L. Courtney is general manager.

The Annapolis Shipbuilding Co., Annapolis Royal, N. S., has started work on a repair dock to handle vessels up to 5000 tons.

The Halifax Shipyards, Ltd., Halifax, N. S., which recently increased its capital stock from \$6,000,000 to \$10,000,000, is making rapid progress on its new plant. The company has received orders from the Dominion Government for the construction of vessels of 10,500 tons.

Two steel ships to be built by the Nova Scotia Steel & Coal Co., New Glasgow, N. S., for the Dominion Government will be of 2800 tons each, and plans are being made to construct ships of 5000 tons as soon as the present contract is completed. This will probably necessitate extensions to the plant and additional equipment.

John Bertram & Sons, Ltd., Dundas, Ont., are erecting a heat treating plant, 60 x 120 ft.

The Port Hope File Mfg. Co., Port Hope, Ont., has purchased a building at Ingersoll, Ont., and will erect an addition. It is the intention to move the equipment from Port Hope to the new plant, which will be known as the Ingersoll File Co. The total expenditure is stated to be \$125,000.

The Mullen Contracting Co., Prince Rupert, B. C., is having plans prepared for alterations and an addition to its shipyards and drydock to cost \$500,000. J. Mullen is manager.

A. Pion, Provost, Alberta, will have plans prepared for the erection of a sheet metal-work factory to be erected in the spring and is asking for prices on material and equipments.

Joseph Pilo, Sapperton, B. C., has had plans prepared for the erection of a tool steel plant to cost \$7,000.

Darling Brothers, Ltd., 120 Prince Street, Montreal, is in the market for a horizontal boring machine with boring bar about 4 in. in diameter, suitable for pump or engine manufacture.

The Lincoln Electric Co. of Canada, Ltd., Toronto, has opened a shop at the foot of Jarvis Street, where it will be in a position to handle all kinds of electric welding work.

The Canadian Car Co., Montreal, will erect a plant at Bowmanville, Ont., to cost \$50,000.

The Pacific Northwest

SEATTLE, Dec. 31.

The machinery markets are showing the effect of peace in that there is a disposition to hold up the placing of orders, with the expectation that prices will be lowered. This is particularly true of large tools and heavy machinery. Small tools are holding up well, and will probably become scarce with the revival of many manufacturing enterprises which have been held non-essential.

Cessation of strictly war work has thrown thousands of men out of employment and serious consideration is being given the matter of a 7-hr. working day for building mechanics and laborers for at least 60 days after Jan. 1, to tide over the period of abrupt transition from war to peace. The plan would not affect building trades men employed in shipyards and kindred industries under the Macey agreement.

The Hesse-Martin Iron Works, Portland, has had plans prepared for a foundry, 50 x 100 ft., of brick, which will duplicate the present structure. It will cost about \$10,000.

The Pacific Marine Iron Works, Portland, plans the construction of a concrete drydock with a lifting capacity of 6000 tons, work to begin soon after Jan. 1.

The Wenatchee Woodworking Mill Co., Wenatchee, Wash., has completed plans for installation of a box-making plant with a capacity of 200,000 boxes. Additional power will be developed.

The Dalles Foundry Co., The Dalles, Ore., recently organized, has purchased the Frederick L. Houghton property and will remodel the plant. It will specialize in light machinery, stove castings and repair work.

Louis Chirchart and associates, White Salmon, Wash., plan the erection of a sawmill and box factory in White Salmon to have a daily capacity of 20,000 ft.

Robert E. Veltum and R. D. Clow, Eugene, Ore., manufacturers of the pneumatic valve grinder, have purchased a factory in that city, and will continue the manufacture of their device. The main building, 60 x 100 ft., will be enlarged.

The Wenatchee Iron Works, Wenatchee, Wash., has been capitalized at \$50,000, and will erect a foundry, 50 x 120 ft.

The Astoria Marine Iron Works, Astoria, Ore., plans a number of improvements to its plant, including installation of machinery. It will also specialize in marine repair work.

The Morrion Steel & Wire Co.'s nail and wire plant at Vancouver, B. C., was recently destroyed by fire with a loss of more than \$150,000. It is stated the plant will probably be rebuilt.

The Northwest Steel Co., Portland, will build two shops, 30 x 180 ft., costing \$5,300, and 30 x 40 ft., costing \$8,500.

The Skinner & Eddy Corporation, Seattle, will build a blacksmith and power house, 100 x 220 ft., to cost \$4,500, and a fitting out shop, 30 x 120 ft., to cost \$7,000.

Miller Brothers, Fossil, Ore., plan a number of improvements to their electric light plant, including the installation of a 75-hp. semi-Diesel engine.

The Consolidated Mining & Smelting Co., Trail, B. C., will equip a department to manufacture copper rods. It will have a daily capacity of 50 tons.

J. A. Taylor and associates, Anacortes, Wash., have purchased a site in that city on which will be erected a shipyard and repair plant for small vessels.

The Marine Repair & Construction Co., Portland, plans to add four shipways to its plant in the near future. It specializes in repairing hulls and rebuilding scows.

NEW TRADE PUBLICATIONS

Drill Press.—Landau Machine and Drill Press Co., Inc., 19-25 West Forty-fourth Street, New York. Pamphlet. Describes a drill press with a multiple drilling head having four separate drilling spindles; also made with one spindle arranged for tapping. Designed so that one spindle operates at a time, the rest remaining idle until wanted. Views of the drill press are given.

Discount Guide.—G. B. Carpenter & Co., 440 North Wells Street, Chicago. Booklet. Gives the discounts and prices of items listed in the firm's catalog No. 110. The listings are given to enable holders of the large catalog to figure approximate prices upon their requirements.

Carriers and Containers.—Rogers Fibre Co., 43 West Sixteenth Street, New York. Catalog. Presents illustrations and brief descriptions of "Leatheroid" factory cars, barrels, boxes, waste baskets, cans, cases and trunks.

Machinists' Index.—Paschall Tool Co., Long Beach, California. Folder. Describes a device for dividing, laying off, off-setting, or lining up work. Made in two sizes: No. 1 for material up to 2½ in. diameter; No. 2 for material up to 4 in. diameter. Illustrations are given showing the use of the index in squaring the end of a round shaft on a lathe; drilling holes at a relative angle to each other; as an index head for the shaper.

Gears.—Boston Gear Works, Norfolk Downs, Massachusetts. Lists a line of standardized gears including spurs, bevels, mitres, spirals, helicals, internals, worm gears and pinion wire. Also lists sprockets and chains, universal joints, thrust collar bearings, ball bearings, and grooved pulleys. Illustrations of the various items are included.

Crane Switchboard.—Electric Controller & Mfg. Co., Cleveland. Bulletin 1041-A. Relates to a standardized switchboard for use in connection with electrically operated cranes, taking the place of the various circuit breakers, knife switches, fuses, etc., usually mounted in a crane cage. Built for operation on 230 volts, direct current, for cranes having two to seven motions, inclusive, and for a maximum total of 450 hp.

Calendars.—William J. Breen & Co., 148 State Street, Boston. Size 21½ x 45 in. A creditable art calendar, reproducing in colors "Over the Top at Vimy Ridge," from the original in oil by W. B. Wollen, a noted English painter of military subjects. Shows the American troops attacking and capturing a German trench. The firm's name appears at the top of the calendar and below the picture, the words pig iron and coke, iron and steel scrap. The calendar pad is 13 x 16 in. with white numerals on a green background.

C. S. Dodge, Lowell, Mass. Size 15 x 22 in. An art calendar, reproducing a scene "An Autumn Sunset," from a water color by C. R. Raymond. Size of picture, 9 x 12 in. The text includes the firm's name, address and business, shoddy machinery and recovering picker cylinders. The days of the month are in black on a white background with the exception of Sundays and holidays, in red.

Edison Storage Battery Co., Orange, N. J. Size 13½ x 30 in. The main portion of the calendar shows a cross section view of a storage battery, the names of the various parts being given. The calendar pad is 3½ x 9½ in., the current month being in the center and the past and following months to the left and right respectively.

Belmont Iron Works, Keystone, Pa. Size 15 x 26 in. The upper portion of the calendar shows a small photograph of the firm's new bridge and structural plant at Eddystone, Pa. The calendar portion gives the current month in the center, the past month above, and the following month below.

Irving National Bank—Irving Trust Co., Woolworth Building, New York. Size 13½ x 21 in. The upper half of the calendar gives the firm's name and address in white on a blue background. The special feature of this calendar is the inclusion at the bottom of each monthly page of information relative to federal taxes, New York corporation's tax, New Jersey corporation's tax, New York City taxes, New York water tax, etc. The date on which these taxes fall due being marked with a star.

American Bank Note Co., 70-72 Broad Street, New York. Size 13 x 19 in. A beautiful example of color work, each month being printed in two colors, one shading gradually into the other.

International Boiler Works Co., East Stroudsburg, Pa. Size 3 x 7 in. Consists of six cards printed on front and back. Each card shows the current, past and following month.

Dearborn Chemical Co., 332 South Michigan Avenue, Chicago. Size, 20 x 27 in. Shows views of the company's plants, and the departments and laboratories concerned with feed-water analysis and treatment.

Cleveland Punch & Shear Works Co., Cleveland. Size, 7 x 10 in. Arranged to show six days on each page. Illustrated with the company's various products.

